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ENVIRONMENTAL REPORT FOR CALENDAR YEAR 1997  
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**Monticello Mill Tailings Site**

# **Environmental Report for Calendar Year 1997**

**October 1998**



**U.S. Department  
of Energy**

**GRAND JUNCTION OFFICE**

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**Monticello Mill Tailings Site Environmental Report**  
**for Calendar Year 1997**

**October 1998**

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**Prepared for  
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## Abbreviations and Acronyms

BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	U.S. Code of Federal Regulations
COE	U.S. Army Corps of Engineers
DCG	derived concentration guideline
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
GJO	Grand Junction Office
IWMA	Interim Waste Management Area
MRAP	Monticello Remedial Action Project
NEPA	National Environmental Policy Act
mg/L	milligrams per liter
MMTS	Monticello Mill Tailings Site
mrem	millirems
mrem/yr	millirems per year
µg/L	micrograms per liter
µg/m <sup>3</sup>	micrograms per cubic meter
µmhos/cm	micromhos per centimeter
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
pCi/µg	picocuries per microgram
PM <sub>10</sub>	particulate matter less than or equal to 10 micrometers in diameter
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RI/FS—EA	Remedial Investigation/Feasibility Study—Environmental Assessment
SARA	Superfund Amendments and Reauthorization Act
SER	Site Environmental Report
SSAB	Site Specific Advisory Board
SWMP	<i>Special Waste Management Plan for the Monticello Mill Tailings Site and Vicinity Properties</i>
TDS	total dissolved solids
TLD	thermoluminescent dosimeter
TSCA	Toxic Substances Control Act
UDEQ	Utah Department of Environmental Quality
UPDES	Utah Pollution Discharge Elimination System
UST	underground storage tank
WWTP	Wastewater Treatment Plant

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## Executive Summary

U.S. Department of Energy (DOE) Order 5400.1, *General Environmental Protection Program* and DOE Order 231.1, *Contractor Requirements Document, Environment Safety and Health Reporting* require that "...all DOE facilities that conduct significant environmental protection programs shall prepare an Annual Site Environmental Report (SER)." The purpose of this report "... is to present summary environmental data so as to characterize site environmental management performance, confirm compliance with environmental standards and requirements, and highlight significant programs and efforts."

This SER presents an update of environmental activities conducted during calendar year 1997 at the Monticello Mill Tailings Site (MMTS) in Monticello, Utah. With exception of environmental monitoring activities (air, surface water, groundwater monitoring, etc.) that may occur on private property, this SER addresses primarily activities performed by the DOE on DOE owned/administered properties in Monticello, Utah. DOE remedial actions conducted on privately owned properties are outside the scope of this document. MACTEC-ERS Inc., the technical assistance and remediation contractor for the DOE-Grand Junction Office, prepared this report in accordance with the substantive requirements of DOE Order 5400.1, *General Environmental Protection Program* and DOE Order 231.1, *Contractor Requirements Document, Environment Safety and Health Reporting*.

Environmental activities conducted at the MMTS during 1997 were associated with the continued construction of the on-site repository and haul road, excavation and placement of tailings in the repository, operation of the wastewater treatment plant (WWTP), and monitoring of environmental media. Remedial action included removal of radioactive uranium and vanadium mill tailings, excavation and demolition of millsite foundations, and reconstruction of remediated peripheral properties. The repository is located 1 mile south of the Monticello millsite and contains tailings and other byproduct materials, and hazardous substances and wastes from the remediation of contaminated properties. Construction of the repository and installation of the liner system was completed in November 1996. Placement of mill tailings into the repository began in June of 1997. By the end of the calendar year (December 1997), approximately 610,000 cubic yards of mill tailings and related materials had been placed into the repository.

The WWTP was designed to treat contaminated surface runoff from the millsite and groundwater encountered during the excavation of contaminated materials. During 1997, the primary focus of activities associated with the WWTP was development of a treatment method to remove selenium from the influent water. Multiple bench scale and on-site tests were conducted to develop the capability to meet the Utah Pollutant Discharge Elimination System (UPDES) effluent limitations. Contaminated water was treated at the Monticello millsite during April through June 1997 using a State-approved temporary increased selenium effluent concentration. Analytical results from the sampling of the effluent during this period are presented in the Compliance Summary section of this report.

Radiological and nonradiological monitoring programs at the MMTS included monitoring of atmospheric radon, particulate matter, direct gamma radiation, surface water, and groundwater. Atmospheric radon concentrations measured during 1997 exceeded the U.S. Environmental Protection Agency (EPA) standard at three locations along the DOE property boundary but were below the standard at all off-site locations. A summary of atmospheric radon monitoring activities and the resulting data are presented in the Environmental Monitoring Summary section of this report.

Maximum airborne concentrations of radium-226, thorium-230, total uranium, and particulate matter less than or equal to 10 micrometers in diameter ( $PM_{10}$ ) measured in samples from all locations were below EPA standards and the regulatory limits specified by DOE Order 5400.5, *Radiation Protection of the Public and the Environment*. Average annual gamma radiation measurements exceeded the DOE/EPA standard at two site-boundary locations. Off-site dose modeling for the MMTS was conducted to determine compliance with the DOE/EPA standard of 100 millirems per year (mrem/yr) above background. The dose, calculated by summing the radon, air particulate, and direct gamma source terms, was below the DOE/EPA standard. A summary of the air particulate, direct gamma radiation monitoring activities, and off-site dose modeling results are presented in the Environmental Monitoring Summary section of this report.

Surface water sampling results from Montezuma Creek indicated that metals and radionuclides associated with mill tailings generally exceeded background levels in samples collected on and downgradient of the millsite. State of Utah water quality standards for gross alpha and total dissolved solids were exceeded in one or more on-site or downgradient samples collected during 1997. A summary of the surface water monitoring activities and the resulting analytical data are presented in the Environmental Monitoring Summary section of this report.

Federal and State of Utah groundwater quality standards for gross alpha, molybdenum, selenium, and uranium-234 + 238 were exceeded in samples from one or more on-site and downgradient alluvial monitoring well. Water quality standards were not exceeded in samples from any upgradient alluvial wells. All upgradient, on-site, cross-gradient, and downgradient Burro Canyon wells, with the exception of downgradient well 95-06, had sample concentrations below Federal and State of Utah groundwater quality standards. The sample from well 95-06 exceeded the uranium-234 + 238 standard. A summary of the groundwater monitoring activities and the resulting analytical data are presented in the Environmental Monitoring Summary section of this report.

During 1997, in keeping with the intent of applicable DOE orders and all applicable or relevant and appropriate federal and state environmental rules and regulations, DOE continued to monitor various environmental media and to work towards completion of the various environmental restoration programs at the MMTS. Significant accomplishments during 1997 included initiation of tailings placement into the repository, modification of the WWTP treatment processes to meet effluent limitations, treatment and disposal of hazardous wastes and substances stored at the MMTS, and continued monitoring of environmental media. Monitoring of environmental media will continue in an on-going effort to document and analyze the impacts that environmental restoration activities have on environmental resources, and to determine compliance of site activities and processes with environmental regulations.

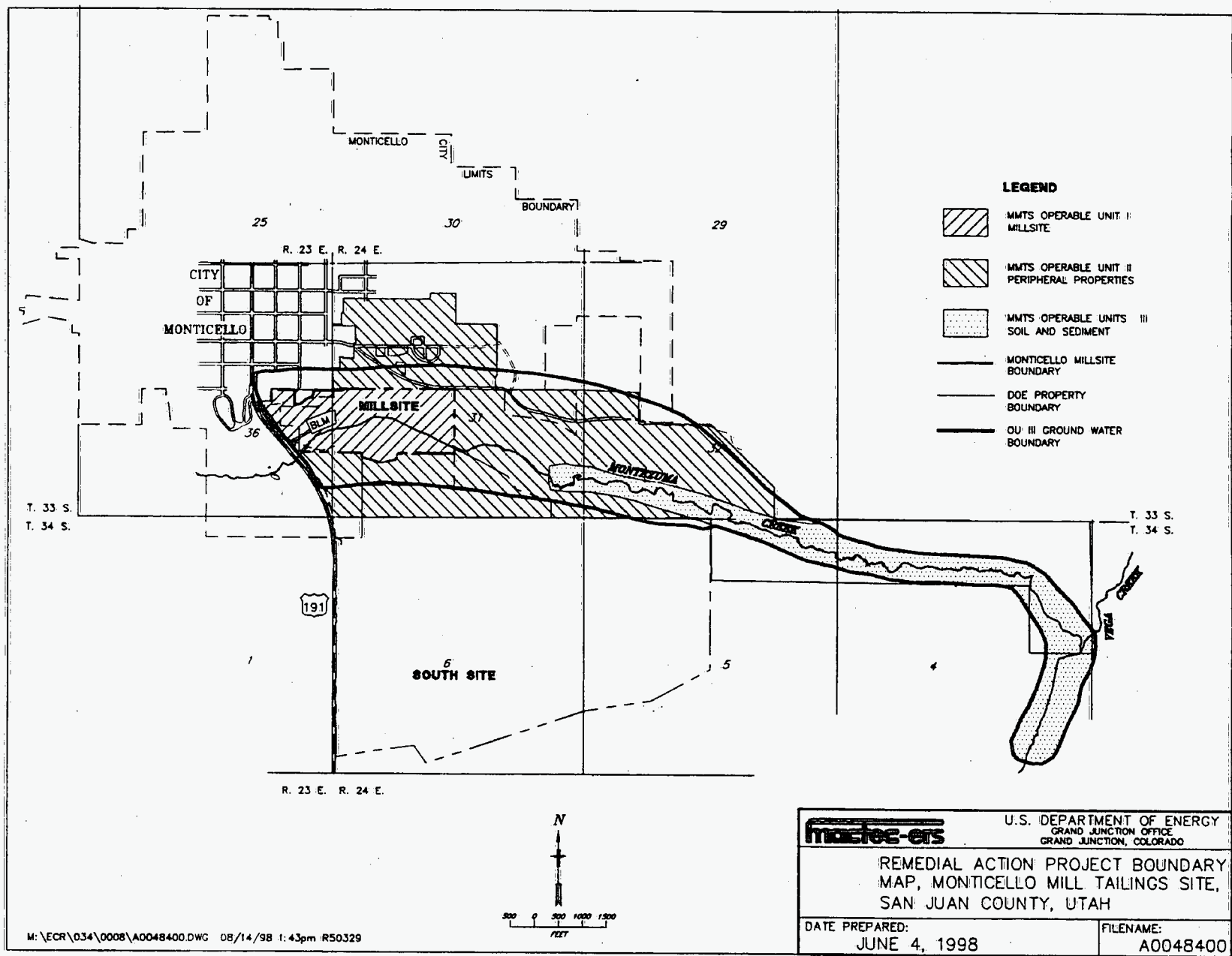
## 1.0 Introduction

The Monticello Mill Tailings Site (MMTS), located in San Juan County, Utah, comprises several tracts of land, including the Monticello millsite, the former Bureau of Land Management (BLM) compound, the South Site, and 29 peripheral properties surrounding the millsite. The DOE owns the former three tracts and several of the peripheral properties. Other entities or individuals own the remaining peripheral properties.

Remediation of the MMTS has been divided into three operable units (OUs) (Figure 1). OU I consists of the excavation of mill tailings and other hazardous substances from the millsite and their containment in the permanent repository; it is located on the South Site. OU II consists of the remediation of radioactively contaminated soils, by-product materials, and hazardous substances from private and DOE-owned properties peripheral to the millsite. Remedial action for OU III addresses contaminated groundwater and surface water on and downgradient of the millsite and contaminated soil and sediment deposited downstream of the millsite.

Consistent with its commitment to public involvement, DOE maintains an active presence in the local community. DOE and contractor personnel regularly attended local Site Specific Advisory Board (SSAB) meetings, city council meetings, chamber of commerce meetings, and other public meetings of importance to the MMTS. The Monticello SSAB is an independent forum that facilitates direct contact between the public, State, and Federal agencies and develops and communicates citizen recommendations. Public availability sessions, fact sheets, news releases, display ads, and radio talk shows also provide an opportunity for public information updates, comments, and input. Citizens with questions, comments, or concerns about the project may call a toll-free number (1-800-269-7145) established for San Juan County residents or may contact the DOE Site Engineer at the Monticello Area Office (435-587-4049) with questions or concerns.

This annual SER presents an information update for environmental activities conducted at the MMTS during calendar year 1997. Significant milestones attained in 1997 also are summarized. Environmental monitoring data for calendar year 1997 are presented in the appendix.



## 2.0 Compliance Summary

### 2.1 Compliance Status

The compliance status for the major environmental statutes and Executive Orders applicable to the MMTS is discussed in this section. The compliance status of some of the statutes and executive orders has not changed since preparation of the 1996 SER (DOE 1997c).

#### 2.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Pursuant to Section 120 of CERCLA, a Federal Facility Agreement (FFA) among the DOE, EPA, and the State of Utah became effective December 1988. The FFA establishes performance measures for completing response actions at the MMTS. These performance measures, or milestones, are enforceable by the FFA. The *Monticello Site Management Plan* (DOE 1997a) establishes the overall plan, timetables, deadlines, and schedules for the performance and documentation of discrete tasks and response actions at the MMTS. Table 1 summarizes the 1997 MMTS enforceable milestones established for OU II. There were no enforceable milestones identified for either OU I or OU III during 1997. During 1997, DOE met both enforceable milestones. DOE activities conducted at the MMTS in 1997 were compliant with all applicable CERCLA regulations and requirements.

*Table 1. Compliance with CERCLA Enforceable Milestones for 1997*

Milestone	Completion Date
MP-00990 - Construction Complete	September 30, 1997
MP-01102 - Design Complete	June 21, 1997

#### 2.1.2 Superfund Amendments and Reauthorization Act, Title III (SARA Title III)

The Emergency Planning and Notification Requirements (Section 301-303) of the Emergency Planning and Community Right-to-Know Act (EPCRA) (also known as SARA Title III) require the owner or operator of a facility to notify the State Emergency Response Commission (SERC) within 60 days if extremely hazardous substances (as identified at 40 CFR 355.20) are present at the facility in amounts that exceed regulatory thresholds. A review of the chemicals and quantities stored and used at the MMTS, showed that an extremely hazardous substance (sulfuric acid) was stored in an amount that exceeded its regulatory threshold; therefore, the MMTS was subject to EPCRA emergency notification requirements during 1997. A notification letter was drafted and submitted to the SERC, the Local Emergency Planning Committee (LEPC), and the local fire department on June 20, 1997.

An inventory of hazardous chemicals and extremely hazardous substances stored at the MMTS was maintained and updated monthly during calendar year 1997. Concentrations of five chemicals exceeded the regulatory threshold established at 40 CFR 370.20(b)(2) and became subject to Tier Two reporting requirements under Sections 311 and 312 of EPCRA. A *Utah Tier Two - Emergency and Hazardous Chemical Inventory Report* was prepared for chemicals which exceeded regulatory/reporting thresholds for calendar year 1997 at the MMTS. It was submitted to the SERC, the LEPC, and the local fire department on February 26, 1998.

The status of additional SARA Title III requirements include

- Sections 301-303: Emergency Planning Notification - Required. Notification letter sent to SERC, LEPC, and local fire department on June 20, 1997.
- Section 304: Emergency Notification - Not Required.
- Sections 311-312: Material Safety Data Sheets/Chemical Inventory - Required. A *Utah Tier Two - Emergency and Hazardous Chemical Inventory Report* was sent to the SERC, LEPC, and local fire department on February 26, 1998.
- Section 313: Toxic Chemical Release Inventory Reporting - Not Required.

### **2.1.3 Resource Conservation and Recovery Act (RCRA)**

The Utah Hazardous Waste Management Rules (U.A.C. 1996) are considered applicable requirements when hazardous waste must be managed as part of the remedial action activities. To address the State and Federal requirements under RCRA, DOE prepared the *Special Waste Management Plan for the Monticello Mill Tailings Site and Vicinity Properties* (SWMP) (DOE 1997b). This document, which has been reviewed by the EPA and State of Utah presents the DOE's approach for the management of wastes contaminated with hazardous substances other than uranium mill tailings that are encountered during remediation of the MMTS.

During 1997, approximately 5 cubic feet of remediation-generated characteristic hazardous waste was generated at the MMTS. In addition to remediation-generated waste, approximately 88 cubic feet of hazardous waste (consisting of activated alumina contaminated with RCRA characteristic metals) was generated in 1997 in association with the operation of the on-site wastewater treatment plant. These RCRA-characteristic hazardous wastes were ultimately disposed of in the on-site repository.

Currently, materials that require special management according to the SWMP may be placed into storage at the Interim Waste Management Area (IWMA), located on a secured area of the millsite or hauled directly to the repository. The *Interim Waste Management Area Operating Plan and Procedures* which is attached to the SWMP, describes the management of the IWMA in detail and provides documentation of compliance with substantive RCRA storage requirements.

The on-site repository was designed to meet the substantive performance criteria of a RCRA Subtitle C disposal facility. Approximately 2,484 cubic feet of RCRA-characteristic hazardous waste, which was generated from both the MMTS and various Monticello vicinity and peripheral

properties from 1995 through 1997, was placed into the on-site repository during the 1997 construction season. Approximately 104 cubic feet of this waste required on-site treatment (e.g., solidification) during August and September 1997 prior to placement in the repository in order to meet the waste acceptance criteria. Additionally, approximately 1.4 cubic feet of RCRA-listed hazardous waste was stored at the IWMA during 1997. This waste was subsequently transported off-site by a commercial transporter to an EPA-approved RCRA-permitted facility during January 1998 as a best management practice.

#### **2.1.4 National Environmental Policy Act**

No changes in the compliance status for this statute have occurred since preparation of the 1996 SER.

#### **2.1.5 Uranium Mill Tailings Radiation Control Act**

No changes in the compliance status for this statute have occurred since preparation of the 1996 SER.

#### **2.1.6 Clean Air Act/National Emission Standards for Hazardous Air Pollutants**

No changes in the compliance status for these statutes have occurred since preparation of the 1996 SER.

#### **2.1.7 Clean Water Act/National Pollutant Discharge Elimination System**

In 1993, DOE submitted a Utah Pollution Discharge Elimination System (UPDES) permit application to the Utah Department of Environmental Quality (UDEQ), Division of Water Quality, for installation of the WWTP. The WWTP was installed in 1995 east of the millsite. The treatment plant treats water in Retention Pond 3 to reduce radionuclides, heavy metals, and suspended solids prior to discharge into Montezuma Creek. Specific effluent limitations from the discharge water were proposed by the State of Utah in 1993 and clarified in February 1994.

During 1997, the WWTP operated from April 18, 1997, through June 7, 1997, and treated and discharged approximately one million gallons of water to Montezuma Creek. On April 22, 1997, a barium chloride feed pump clogged, causing discharge of approximately 8,000 gallons of water that exceeded the UPDES selenium effluent limitation. Because the water levels in Pond 3 were above the operating level, DOE requested and received a variance to the selenium discharge criterion from the State of Utah that allowed an increased discharge concentration until Pond 3 was at the operating level. The justification for this increase was based on increased flows in the receiving water; therefore, in-stream concentrations for selenium were not exceeded. A comparison of the State water quality standards to the WWTP effluent analyses is presented in Section 2.2.4.

Samples were collected 3 times during plant operations to ensure the effluent discharge was in compliance with the UPDES effluent limitations.

### **2.1.8 Safe Drinking Water Act**

No changes in the compliance status for this statute have occurred since preparation of the 1996 SER.

### **2.1.9 Toxic Substances Control Act (TSCA)**

The production, use, distribution, and disposal of toxic chemicals is regulated by the Toxic Substances Control Act as found at 40 CFR 700 - 789. The only substances regulated by TSCA that have been encountered at the millsite to date are polychlorinated byphenyls (PCBs) and asbestos-containing materials (ACM).

ACM was remediated during 1996 from various structures and buildings located on the former millsite and the BLM Compound. During 1997, this ACM waste was stored in 55-gallon drums on the millsite in a designated asbestos waste storage area. A total of 169 drums of ACM waste was placed into the on-site repository during the spring of 1998.

Also during 1997, additional ACM was encountered during the remediation of the carbonate pile located on the millsite. The ACM encountered in this area consisted mostly of non-friable transite piping; however, a significant volume of friable thermal system insulation (TSI) material was found on pieces of the millsite roaster ovens (and other miscellaneous equipment associated with the uranium milling process) which were discovered to have been buried in the carbonate tailings pile. Due to the health hazards associated with handling friable ACM, institutional controls (e.g., encapsulation of debris, equipment, and soils contaminated with ACM, isolation and restriction of localized activity, etc.) were implemented to prevent the release of friable materials to the environment and to mitigate potential health hazards. After the ACM contaminated area was secured and prior to remediation of the ACM area, DOE prepared the *Monticello Projects Asbestos Management Plan* (DOE 1997d) in response to the need for the safe and compliant handling, management, and disposal of the ACM. The plan was sent to the Utah Department of Environmental Quality, Division of Air Quality for concurrence in November 1997. Permit approval was received from the State, and all work was completed in compliance with the Utah Administrative Code, R307-1-8, *Utah Air Conservation Rules* (U.A.C. 1996). A total of approximately 1,200 cubic yards of ACM contaminated debris and soil that originated from less than 5,000 square feet of asbestos-covered structural components was remediated from the carbonate pile area and disposed of in the on-site repository during the spring and summer of 1998.

No PCBs or other TSCA-regulated substances were encountered during remedial activities at the millsite during 1997.

### **2.1.10 Federal Insecticide, Fungicide, and Rodenticide Act**

No changes in the compliance status for this statute have occurred since preparation of the 1996 SER (pesticides were not used on the MMTS in 1997).

### **2.1.11 Endangered Species Act**

In 1997, DOE requested a formal consultation with the U.S. Fish and Wildlife Service in accordance with Section 7 of the Endangered Species Act (50 CFR 402). The consultation was initiated because DOE's remedial actions associated with the MMTS may affect the endangered Colorado squawfish and razorback sucker that inhabit the San Juan River, 50 miles downstream of the MMTS site. Critical habitat for these species has been designated along the stretch of the San Juan River below the confluence of Montezuma Creek and the San Juan River. DOE prepared a Biological Assessment (DOE 1998a), which describes the potential depletions in flow that could occur in the San Juan River from MMTS activities. DOE estimated that, over the life of the MMTS project, an average of 10 acre-feet of water per year could be consumptively used for remedial activities.

The U.S. Fish and Wildlife Service issued its final biological opinion in April 1998. The opinion stated that the water depletion would "likely jeopardize the continued existence of the Colorado squawfish and razorback sucker and modify their critical habitat." However, the Service developed a "reasonable and prudent" alternative that removes the threat of jeopardy to the endangered fish and avoids adverse modifications to their critical habitat. This alternative involves the Bureau of Reclamation reoperating the Navajo Dam to mimic the natural hydrograph of the San Juan River.

### **2.1.12 National Historic Preservation Act/Archeological Resources Protection Act**

In compliance with the State-approved cultural resources mitigation plan for the Monticello Remedial Action Program, an annual inspection of the significant prehistoric sites identified along Montezuma Creek and within the project boundaries was conducted during September 1997. Evidence of recent human visitation (e.g., trash, movement of surface items) was present at some of the sites; however, signs of invasive (subsurface) disturbance were not observed at any of the sites inspected. Cultural resources and archaeological sites/artifacts were not encountered or disturbed during 1997 construction activities at the MMTS.

### **2.1.13 Executive Order 11988, "Floodplain Management"**

No changes relevant to Floodplain Management for Montezuma Creek occurred in calendar year 1997. Adverse impacts associated with direct and indirect development of the floodplain are evaluated for each remedial design prepared.

### **2.1.14 Executive Order 11990, "Protection of Wetlands"**

Until 1996, wetland restoration at the MMTS was accomplished on a site-specific basis. In March 1996, the *Monticello Wetlands Master Plan* (Master Plan) (DOE 1995a) was submitted to EPA and the State. The Master Plan provides guidelines for mitigation of all disturbed MMTS wetland areas. Goals of the Master Plan ensure that (1) CERCLA cleanup activities comply with applicable wetland regulations and guidance; (2) adverse effects to wetland areas are avoided where possible; (3) unavoidable adverse effects to wetland areas are minimized; and (4) adverse

effects to wetland areas are mitigated. The Master Plan provides delineation results, mitigation measures, and monitoring plans for disturbed wetland areas at the MMTS.

Wetland areas at the MMTS total 11.5 hectares (28.5 acres). Approximately 4 hectares (9 acres) of wetland areas have been or will be affected by remedial activities. Wetland types in Monticello include perennial streams, intermittent streams, emergent wetlands, depression wetlands, and stock ponds. Wetland areas are restored in situ where possible; otherwise they will be re-created at the millsite (except for two small wetland areas adjacent to the haul road that were re-created on adjacent DOE-owned property). Restoration efforts include restoration of size and function of wetland areas, minimization of erosion, prevention of weed encroachment, and use of ecotype plant species. The seed is collected locally when possible.

Re-created wetland areas are monitored for a minimum of 3 years until success criteria are achieved. DOE submits a wetland monitoring report to EPA each year that summarizes the results of wetland monitoring. During 1997, seven wetland areas were monitored; the annual report was submitted to EPA in January 1998 (DOE 1998b).

#### **2.1.15 State of Utah Groundwater Quality Protection Regulations**

No changes in the compliance status for this statute have occurred since preparation of the 1996 SER. Concentrations in samples collected from downgradient Burro Canyon well 95-06 during 1997 exceeded Federal standards for gross alpha and uranium-234 +238. However, the OU III *Remedial Investigation* (RI) (DOE 1998c) has concluded that the Burro Canyon aquifer is not contaminated. The elevated concentrations observed in this well are attributed to natural fluctuations in groundwater quality. This well was installed in January 1996.

#### **2.1.16 Title 73, "Water and Irrigation," Utah Code Annotated**

During calendar year 1997, four monitoring wells no longer needed for project purposes were abandoned at the Monticello millsite and adjoining properties. All wells were abandoned in compliance with the *State of Utah Administrative Rules for Water Well Drillers* (R655-4-12 of the Utah Administrative Code).

## **2.2 Environmental Issues and Actions**

### **2.2.1 Suspect Hazardous Substances**

The process for managing suspect CERCLA hazardous substances discovered before or during remediation is identified in the SWMP (DOE 1997b). This document addresses the procedures for identifying and characterizing suspect hazardous substances and the processes for remediating and verifying hazardous substances. It also addresses waste management issues.

During 1997, suspect hazardous substances were remediated from one peripheral property (MP-00181) and at several locations on the millsite. During remediation, the use of the management process prescribed in the SWMP was triggered.

### **2.2.2 Underground Storage Tanks**

DOE permanently closed one diesel underground storage tank (UST) on peripheral property MP-00211-VL during the 1997 construction season. The UST, which is believed to have supported historic milling operations, was closed in accordance with the applicable State of Utah UST Rules. DOE was notified by the State of Utah's Executive Secretary of the Division of Environmental Response and Remediation, UST Section, on November 26, 1997, that the low levels of petroleum contamination remaining at the site complied with the Utah UST closure requirements and that no further corrective action was required. Further corrective action would be required only if a change in land use or other evidence of contamination from the facility was indicated.

### **2.2.3 Repository Construction**

DOE reconfirmed the decision to construct a repository on 80 acres of DOE-owned land south of the millsite (i.e., South Site) in December 1994 (see Figure 1). The favorable hydrogeologic setting, as well as the design features of the repository, will ensure that the site is protective of human health and the environment. Repository design was finalized in August 1995, and the construction subcontract was awarded in September 1995. Repository construction was initiated in November 1995 and is currently in progress.

Excavation of the repository and installation of the repository liner were completed in November 1996. The repository is designed to contain 2.6 million cubic yards of contaminated material. Placement of the FS-1 sand material was completed in May 1997. Placement of tailings into the repository began in June 1997. A total of 610,000 cubic yards of tailings was placed into the repository during 1997.

A multi-layer cover that includes a radon barrier and vegetated cover will be constructed after placement of contaminated materials is complete. Facilities associated with the operation of the repository include runoff-control ditches, sediment ponds, soil stockpiles, Pond 4 (used to contain water removed from the repository leachate collection and leak detection systems), and a support area that contains office trailers, lunchrooms, restrooms, and other administrative facilities.

### **2.2.4 Wastewater Treatment Plant**

The WWTP is designed to remove heavy metals and radionuclides from groundwater and surface wastewaters at an average flow rate of 60 gallons per minute. The plant equipment is housed in three 48-foot trailers.

The wastewater treatment system employed at the MMTS encompasses all three of the classic treatment processes: primary treatment, secondary treatment, and advanced or tertiary treatment. The primary treatment system consists of the collection pond (Retention Pond 3) located downgradient of the tailings storage areas. Secondary treatment is provided by Trailers 1 and 2. Tertiary treatment is provided by Trailer 3. Trailers 1 and 2 are currently operational. Trailer 3, housing the tertiary treatment, was modified in 1996 to remove selenium from the water.

During tailings excavation, surface and sub-surface waters are collected and routed to Pond 3 prior to treatment by the WWTP. Wastewaters from various areas of the MMTS are collected and mixed in Pond 3 so that the water influent to the WWTP meets the influent water quality requirements of the plant specifications. Larger sediment particles settle to the bottom of Pond 3, thus providing primary treatment. This sediment will be removed from the pond and placed in the on-site repository when the pond is decommissioned at the end of the project.

To meet the discharge effluent criteria, secondary treatment processes are employed to treat the contaminated solids in the wastewater solution. The secondary treatment system includes chemical precipitation, sedimentation, and membrane filtration. Trailer 2 contains the chemical precipitation process. The process involves addition of various chemicals to convert the solids in solution to a colloidal suspension prior to filtration. The membrane filtration system in Trailer 2 then filters the solids from the wastewater, producing a clean filtrate that can be discharged to the receiving waters. To verify that the discharge criteria established by the UDEQ, Division of Water Quality are met, water samples are collected and analyzed. If the filtrate produced by the secondary treatment does not meet the regulatory discharge criteria for one or more of the analytes, the tertiary treatment must be employed.

The tertiary treatment consists of ion-exchange, adsorption, and filtration media with 60-mesh or larger filters. Choice of the appropriate media is dependent on the analyte to be removed and the specific chemistry of the influent. To remove selenium, activated alumina is used. As in the case of the secondary treatment system, samples are collected from the discharged water to verify that the State discharge criteria are met.

In 1997, WWTP operations were initiated in April by using Trailers 1, 2, and 3, and the decision was made to discharge on April 18, 1997. WWTP compliance sample results are found in Table 2. On April 22, 1997, just after an UPDES compliance sample was collected, the plant operator noticed that sulfate levels entering the activated alumina columns were excessive. The plant was immediately placed into the recirculation mode, and the source of the excessive levels were attributed to a clogged barium feed pump. As a result of the clogged barium feed pump, the results of the UPDES compliance samples indicated that concentrations of selenium exceeded the maximum discharge criteria of 0.020 mg/L. At approximately the same time, the State of Utah imposed a barium effluent limitation of 1 mg/L. Testing revealed that the plant was not able to remove selenium to below the effluent limitations and still meet the barium effluent limitation. The DOE applied to the State of Utah and subsequently received a temporary selenium discharge limitation because Pond 3 was above the operating level and would not provide adequate capacity for stormwater. The temporary discharge limitation of 0.036 mg/L for selenium allowed discharge to occur by using only Trailers 1 and 2, providing stream flows in Montezuma Creek were at least 3.0 cubic feet per second, and only until the water level in Pond 3 was reduced to the operating level. Modifications were made to the WWTP in May and June 1997 to remove barium from the effluent. The modifications were unsuccessful as demonstrated in a test run while the WWTP was in a recirculation mode. Six bench-scale tests were performed in August and September 1997, by using water from the WWTP, to determine the problem with the barium removal system. It was determined from the series of bench-scale tests that solids contact removal, or seeding, was the best option for barium removal. One bench-scale test was

Table 2. WWTP Effluent Compliance Sample Results

	Maximum Effluent Concentration Limit	30-day Average Concentration Limit	Practical Quantitation Limit	Effluent Sample Date		
				4/22/97	5/26/97 <sup>3</sup>	6/7/97 <sup>3</sup>
TSS (mg/L)	30	20	10	U <sup>1</sup>	U <sup>1</sup>	U <sup>1</sup>
BOD (mg/L)	35	25	2	U <sup>1</sup>	U <sup>1</sup>	U <sup>1</sup>
COD (mg/L)	200	100	5	23	13	11
Total Radium-226 (pCi/L)	5	NA	0.4	0.2 ± .3	0.3 ± 0.4	0.1 ± 0.3
Dissolved Radium-226 (pCi/L)	NA	3	0.4	0.1 ± .4	0.2 ± 0.4	0.0 ± 0.4
Uranium (mg/L)	4	2	0.0004	0.008	0.0041	0.0016
Total Zinc (mg/L)	0.34	0.31	0.02	U <sup>1</sup>	U <sup>1</sup>	U <sup>1</sup>
Ammonia as N (mg/L)	5.6	3.9	0.1	U <sup>1</sup>	U <sup>1</sup>	U <sup>1</sup>
Gross Alpha (pCi/L)	50	NA	10	0.0 ± 2.5	6.5 ± 2.9	6.2 ± 5.5
Total Arsenic (mg/L)	0.05	0.01	0.003	U <sup>1</sup>	U <sup>1</sup>	U <sup>1</sup>
Total Mercury (mg/L)	0.0024	0.00002	0.0002	U <sup>1</sup>	U <sup>1</sup>	U <sup>1</sup>
Iron (mg/L)	1	NA	0.1	U <sup>1</sup>	U <sup>1</sup>	U <sup>1</sup>
Total Lead (mg/L)	0.05	0.016	0.002	U <sup>1</sup>	U <sup>1</sup>	U <sup>1</sup>
Total Selenium (mg/L)	0.020	0.012	0.005	0.102	0.02	0.015
Total Silver (mg/L)	0.035	0.00012	0.005	U <sup>1</sup>	U <sup>1</sup>	U <sup>1</sup>
Oil and Grease (mg/L)	10	NA	1	1	U <sup>1</sup>	U <sup>1</sup>
pH	NA	6.5 - 9.0	NA	Not Available <sup>1</sup>	7.3	Not Available <sup>1</sup>
Nitrate as N (mg/L)	10	5	0.1	0.6	0.7	0.5
TDS (mg/L)	3000	1500	10	588	712	758
Total Aluminum (mg/L)	0.75	0.25	0.05	0.07	U <sup>1</sup>	U <sup>1</sup>
Total Barium (mg/L)	10	1	0.02	1.46	0.06	0.07

<sup>1</sup> U=Undetected<sup>2</sup> pH not reported by OIIM.<sup>3</sup> Effluent discharge using Trailers 1 and 2 only, using State-approved increased selenium discharge limitation

performed in August 1997 by using water from the WWTP to evaluate selenium removal by precipitation. This bench-scale test was unsuccessful. Field-scale testing using seeding was conducted in October 1997 with the WWTP in the recirculation mode. The testing was unsuccessful, and a method to remove both selenium and barium, concurrently, to below their respective effluent limitations was not identified.

*The Monticello Wastewater Treatment Plant UPDES Permit Modification Request*, (DOE 1997e) was prepared and submitted to the State of Utah to request a permit modification. The permit modification requested that the State of Utah approve an ammended selenium effluent limitation based on oxidation state (selenate verses selenite), and that the effluent limitations be flow proportional, specifically for the selenate and selenite oxidation states.

While the State of Utah was reviewing the proposed permit modification, the DOE continued to research new methods of barium and selenium removal. No clear methodology was identified in 1997 to successfully remove the selenium from the influent water. However, in 1998 the DOE installed a reverse osmosis system to operate in conjunction with the existing treatment process, and is successfully treating water to below the effluent limitations.

## 3.0 Environmental Monitoring Summary

Historical environmental monitoring information, sampling techniques, and regulatory guidance pertaining to environmental monitoring are presented in the 1994 and 1995 SER. Environmental monitoring data collected during 1997 are presented in this section.

### 3.1 Atmospheric Radon

Radon concentration was measured at 41 locations during 1997 (Figure 2) with Landauer Radtrak alpha-sensitive detectors. As in previous years, the detectors were exposed in duplicate 1 meter (3.28 feet) above the ground surface and were analyzed quarterly (3-month exposure).

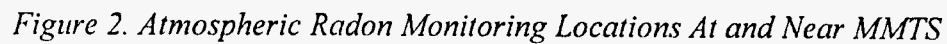
The site-specific standard of 0.9 picocuries per liter (pCi/L) was calculated by adding the EPA standard (40 CFR 192) of 0.5 pCi/L (annual average) to the natural background concentration of 0.4 pCi/L. As shown in Table 3, the atmospheric radon concentrations measured during 1997 exceeded or equaled the EPA standard at three locations along the DOE property boundary. It is expected that when the tailings have been removed from the present location and placed into the on-site repository that all radon sampling locations exceeding the standard will return to background levels. Concentrations at the off-site locations were below the standard. Quarterly data collected at each location are listed in Appendix A, Tables A-1 through A-4.

### 3.2 Air Particulates

The 1997 air sampling network consisted of (1) eight high-volume air samplers that sample ambient air at approximately 1.13 cubic meters per minute ( $\text{m}^3/\text{min}$ ) for 24 hours every sixth day for particulate matter less than or equal to 10 micrometers in diameter ( $\text{PM}_{10}$ ) and elemental lead; and (2) nine low-volume (flow rate of  $0.06 \text{ m}^3/\text{min}$ ) air samplers adjacent to the MMTS and the city of Monticello that sample radioparticulates (radium-226, thorium-230, polonium-210, and total uranium). Figure 3 depicts the locations of the air particulate samplers at and near the MMTS that provide on-site, off-site, and background data for air particulates.

Tables 4 and 5 compare measured  $\text{PM}_{10}$  and lead concentrations to EPA standards. Acceptable levels of  $\text{PM}_{10}$  and lead are defined in the National Ambient Air Quality Standards (40 CFR 50). During 1997, the concentrations of  $\text{PM}_{10}$  and lead measured at all sampling locations were well below EPA standards.

The annual average concentration of  $\text{PM}_{10}$  measured at the six samplers surrounding the MMTS was  $13 \mu\text{g}/\text{m}^3$ , and the average 24-hour maximum concentration measured at these samplers was  $61 \mu\text{g}/\text{m}^3$ . Background concentrations measured at location AIR-M-9 were  $8 \mu\text{g}/\text{m}^3$  (annual average) and  $31 \mu\text{g}/\text{m}^3$  (maximum concentration). The higher  $\text{PM}_{10}$  concentrations near the MMTS were probably caused by fugitive dust from remedial activities on the millsite, construction of the repository, vehicular traffic on unpaved roads, and dirt from streets in and around Monticello. Lead concentrations adjacent to the millsite are equivalent to background levels. Results of  $\text{PM}_{10}$  and lead analyses for individual stations are listed in Appendix A, Tables A-5 through A-9.



*Table 3. Comparison of Average Annual Radon Concentrations At and Near  
MMTS with EPA Standard During 1997*

Sampling Location	Radon Concentration	
	Annual Average (pCi/L) <sup>a</sup>	EPA Standard (Including background) (pCi/L)
On-Site		
R-M-11-RN	1.0	1.0
R-M-8-RN	0.4	1.0
RN-M-06	0.7	1.0
RN-M-07	1.4	1.0
RN-M-08	0.6	1.0
RN-M-09	0.9	1.0
RN-M-16	0.5	1.0
RN-M-18	0.5	1.0
RN-M-20	0.4	1.0
RN-M-22	0.7	1.0
RN-M-24	0.5	1.0
RN-M-26	0.5	1.0
RN-M-28	0.5	1.0
RN-M-30	0.6	1.0
RN-M-32	0.5	1.0
RN-M-34	0.4	1.0
RN-M-37	0.5	1.0
RN-M-38	0.9	1.0
RN-M-39	0.4	1.0
RN-M-40	0.8	1.0
RN-M-41	0.5	1.0
RN-M-42	0.5	1.0
RN-M-43	0.5	1.0
RN-M-44	0.8	1.0
RN-M-45	0.6	1.0
RN-M-46	0.5	1.0

<sup>a</sup> 1 pCi/L =  $3.7 \times 10^{-2}$  becquerels per liter.

*Table 3 (continued). Comparison of Average Annual Radon Concentrations At and Near MMTS with EPA Standard During 1997*

Sampling Location	Radon Concentration	
	Annual Average (pCi/L) <sup>a</sup>	EPA Standard (Including background) (pCi/L)
Off-Site		
R-M-1-RN	0.4	1.0
R-M-2-RN	0.4	1.0
R-M-3-RN	0.5	1.0
R-M-4-RN	0.4	1.0
R-M-5-RN	0.4	1.0
R-M-6-RN	0.4	1.0
R-M-7-RN	0.4	1.0
R-M-9-RN	0.5	1.0
RN-M-04	0.7	1.0
RN-M-10	0.4	1.0
RN-M-11	0.4	1.0
RN-M-13	0.4	1.0
RN-M-14	0.4	1.0
RN-M-15	0.4	1.0
RN-M-17	0.3	1.0
RN-M-19	0.3	1.0
RN-M-21	0.3	1.0
RN-M-47	0.6	1.0

<sup>a</sup> 1 pCi/L =  $3.7 \times 10^{-2}$  becquerels per liter.

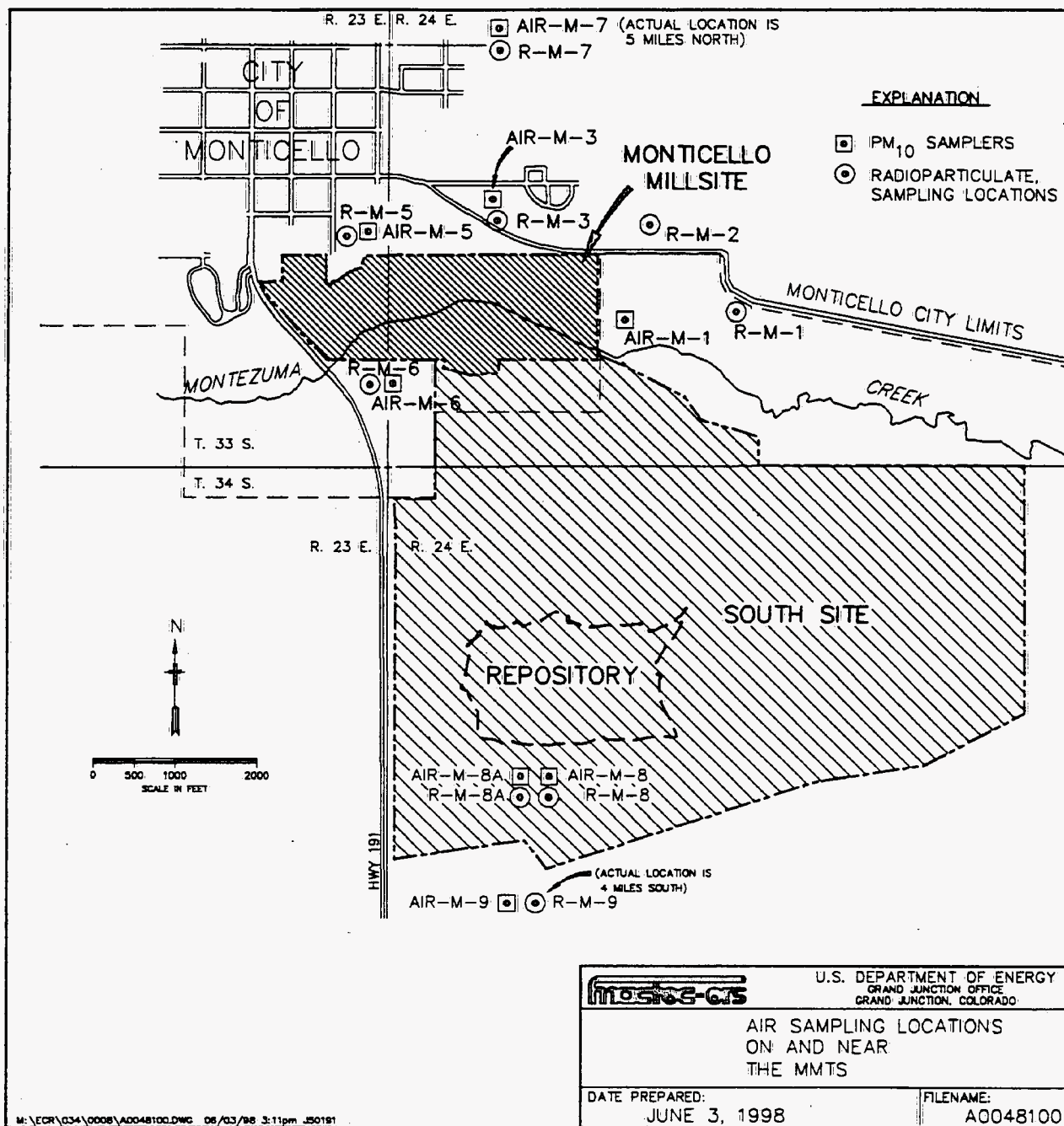


Figure 3. Air Sampling Locations On and Near the MMTS

*Table 4. Results of MMTS PM<sub>10</sub> Monitoring Conducted During 1997*

Station		Measured PM <sub>10</sub> <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ )	EPA Standards ( $\mu\text{g}/\text{m}^3$ )
AIR-M-1	Maximum	35	150
	Average	12	50
	Count	42	
AIR-M-3	Maximum	58	150
	Average	14	50
	Count	42	
AIR-M-5	Maximum	34	150
	Average	13	50
	Count	35	
AIR-M-6	Maximum	26	150
	Average	8	50
	Count	42	
AIR-M-7	Maximum	29	150
	Average	8	50
	Count	43	
AIR-M-8	Maximum	109	150
	Average	15	50
	Count	40	
AIR-M-8A	Maximum	104	150
	Average	16	50
	Count	33	
AIR-M-9	Maximum	31	150
	Average	8	50
	Count	39	

<sup>a</sup> The numbers given in this table are defined as follows:  
 Maximum - Maximum concentration observed in sample period.  
 Average - Annual average concentration.  
 Count - Number of samples collected.

Table 5 compares 1997 maximum and average radioparticulate concentrations with DOE derived concentration guidelines (DCGs). A DCG represents the concentration that would cause a member of the public, residing at the point of collection, to receive a dose of 100 millirem per year (mrem/yr) from a specified radionuclide. Exposures above this limit are considered unacceptable. All measured concentrations of radium-226, thorium-230, polonium-210, and total uranium were two to four orders of magnitude below the respective DCGs. Results of individual analyses are listed in Appendix A, Table A-13.

### 3.3 Direct Gamma Radiation Monitoring

Environmental radiation monitoring is conducted to assess the potential gamma radiation dose to persons on and near the millsite. Gamma radiation measurements are included, along with radiation measurements associated with radon and air particulates, in the calculation of total off-site dose to the public to determine compliance with the DOE/EPA standard of 100 mrem/yr above background (see Section 3.4, Off-Site Dose Modeling).

During 1997, 38 monitoring locations (Figure 4) on the DOE property line and surrounding areas were monitored quarterly by using  $\text{CaSO}_4\text{:Dy}$  (calcium sulfate: dysprosium) thermoluminescent dosimeters (TLDs). Results of the monitoring are presented in Appendix A, Tables A-14 through A-17 and are summarized in Table 6. The background level of gamma radiation of 103 mrem/yr was measured at station R-M-9-TLD. Two DOE property-line locations yielded annual average measurements greater than the standard; annual averages of measurements collected off the millsite were below the standard. Levels of gamma radiation at the DOE boundary are expected to decrease to background levels after remediation is completed.

### 3.4 Off-Site Dose Modeling

Monitoring data collected during 1997 were used to calculate the effective dose equivalent (EDE) to the maximally exposed off-site individual near the MMTS. Calculation of the EDE of the maximally exposed off-site individual living approximately 100 meters (328 feet) north of the site boundary involved summing the radon, air particulate, and gamma source terms at this location. The dose caused by these sources was 28 mrem/yr (0.28 millisievert per year) from gamma radiation. The dose resulting from radioparticulate emissions and radon was indistinguishable from background concentrations.

As required by DOE Order 5400.5, the collective population dose was calculated. The dose assessment model CAP88PC predicted that the collective dose to persons residing within an 80-kilometer (50-mile) radius of the MMTS was 72.60 person-rem per year (0.73 person-sievert per year). Because a reliable source term for radionuclides could not be derived, it was not included in the population dose estimate. However, on the basis of ambient air radionuclide concentrations measured at the site (see Table 7 in this report), the population dose from DOE-caused radionuclide emissions was expected to be minimal. Because most of the tailings piles covers have been removed, the radon source term was increased from 1,573 to 4,011 curies.

**Table 5. Results of the MMTS Radioparticulate Monitoring Conducted During 1997<sup>a</sup>**

		Radiological Elements					
		Radium-226 ( $\mu\text{Ci/mL}$ ) <sup>b</sup>	Polonium-210 ( $\mu\text{Ci/mL}$ ) <sup>b</sup>	Thorium-230 ( $\mu\text{Ci/mL}$ ) <sup>b</sup>	Thorium-230 (pg/mL) <sup>c</sup>	Uranium (pg/mL)	Uranium ( $\mu\text{Ci/mL}$ ) <sup>b, d</sup>
DCG		1.0E-12	1.0E-12	4.0E-14	No Standard	No Standard	2.0E-12
Station							
R-M-1-AIR	Maximum <sup>e</sup>	1.0E-15	5.5E-15	9.1E-16	4.7E-08	-1.0E-03	-6.9E-16
	Average	5.5E-16	3.7E-15	4.8E-16	2.5E-08	6.1E-04	4.2E-16
	Count	9 ( 8)	9 ( 9)	9 ( 8)	9 ( 8)	9 ( 8)	9 ( 8)
R-M-2-AIR	Maximum	7.8E-16	4.4E-15	7.4E-16	3.8E-08	-8.6E-04	-5.9E-16
	Average	4.9E-16	3.1E-15	3.7E-16	1.9E-08	5.9E-04	4.1E-16
	Count	9 ( 8)	9 ( 9)	9 ( 9)	9 ( 9)	9 ( 8)	9 ( 8)
R-M-3-AIR	Maximum	2.4E-15	5.3E-15	2.2E-15	1.1E-07	-1.4E-03	-9.6E-16
	Average	7.5E-16	3.4E-15	7.9E-16	4.1E-08	7.1E-04	4.9E-16
	Count	9 ( 9)	9 ( 9)	9 ( 8)	9 ( 8)	9 ( 9)	9 ( 9)
R-M-5-AIR	Maximum	9.4E-16	5.6E-15	7.5E-16	3.9E-08	-8.8E-04	-6.0E-16
	Average	4.1E-16	3.2E-15	4.0E-16	2.1E-08	5.9E-04	4.1E-16
	Count	7 ( 7)	7 ( 7)	7 ( 7)	7 ( 7)	7 ( 7)	7 ( 7)
R-M-6-AIR	Maximum	5.8E-16	4.9E-15	3.8E-16	2.0E-08	-6.6E-04	-4.5E-16
	Average	3.7E-16	3.3E-15	2.5E-16	1.3E-08	4.5E-04	3.1E-16
	Count	9 ( 9)	9 ( 9)	9 ( 9)	9 ( 9)	9 ( 8)	9 ( 8)
R-M-7-AIR	Maximum	2.8E-16	4.8E-15	1.8E-16	9.3E-09	-5.0E-04	-3.4E-16
	Average	1.5E-16	3.2E-15	1.3E-16	6.7E-09	3.4E-04	2.3E-16
	Count	9 ( 9)	9 ( 9)	9 ( 9)	9 ( 9)	9 ( 8)	9 ( 8)
R-M-8-AIR	Maximum <sup>e</sup>	3.5E-16	4.2E-15	2.4E-16	1.2E-08	-6.7E-04	-4.6E-16
	Average	2.4E-16	3.0E-15	1.9E-16	9.8E-09	4.2E-04	2.9E-16
	Count	8 ( 8)	8 ( 8)	8 ( 8)	8 ( 8)	8 ( 8)	8 ( 8)
R-M-8A-AIR	Maximum	4.6E-16	5.1E-15	2.9E-16	1.5E-08	5.0E-04	3.4E-16
	Average	2.8E-16	3.3E-15	2.2E-16	1.1E-08	4.1E-04	2.8E-16
	Count	7 ( 7)	7 ( 7)	7 ( 7)	7 ( 7)	7 ( 7)	7 ( 7)
R-M-9-AIR	Maximum	3.1E-16	3.0E-15	1.6E-16	8.2E-09	-4.5E-04	-3.1E-16
	Average	1.6E-16	2.1E-15	1.1E-16	5.7E-09	3.4E-04	2.3E-16
	Count	9 ( 9)	9 ( 9)	9 ( 8)	9 ( 8)	9 ( 8)	9 ( 8)

<sup>a</sup> A "-" indicates an approximate value (the value was outside the limits for which the instrument was calibrated). Scientific notation E-15 = " $\times 10^{-15}$ ."

<sup>b</sup> 1 microcurie per milliliter ( $\mu\text{Ci/mL}$ ) =  $3.7 \times 10^4$  becquerels per milliliter.

<sup>c</sup> pg/mL = picograms per milliliter. The conversion of thorium-230 concentrations between microcuries and picograms assumes equilibrium and an activity of 0.0194  $\mu\text{Ci}/\mu\text{g}$ .

<sup>d</sup> The conversion of uranium concentrations between microcuries and picograms assumes equilibrium and an activity of 0.687 pCi/ $\mu\text{g}$ .

<sup>e</sup> The numbers given in this table are defined as follows:

Maximum - Maximum concentration observed in sample period.

Average - Annual average concentration. Samples above detection limit are used in calculation.

Count - Number of samples collected. The number in parentheses indicates the number of samples having concentrations above the detection limit.

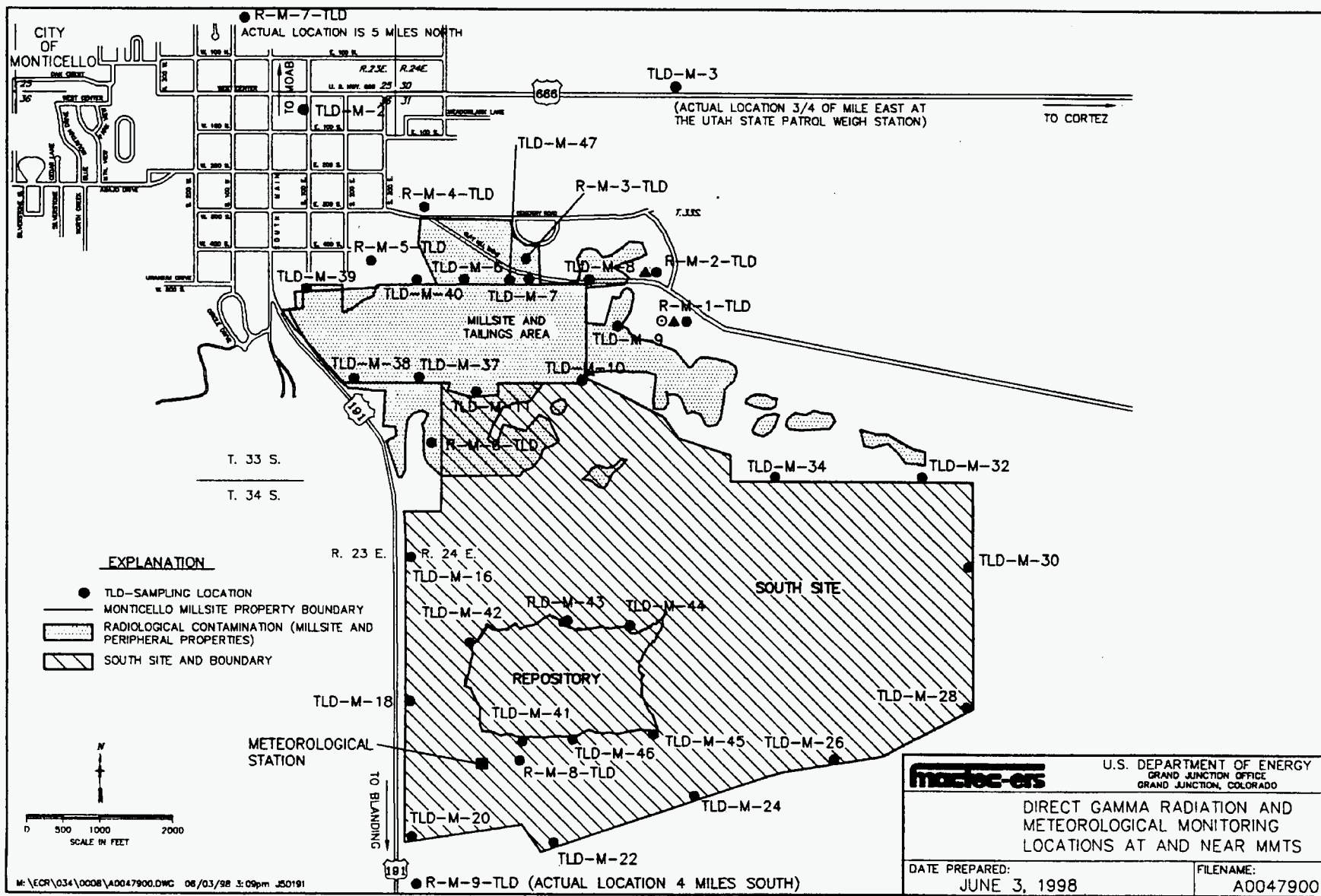


Figure 4. Direct Gamma Radiation and Meteorological Monitoring Locations At and Near MMTS

Table 6. Average Annual Gamma Exposure Rates At and Near the MMTS During 1997

Sampling Location	Gamma Exposure	
	Annual Average (mrem/yr) <sup>a</sup>	DOE Standard (mrem/yr) <sup>b</sup>
On-Site		
R-M-8-TLD	109	203
TLD-M-06	517	203
TLD-M-07	129	203
TLD-M-08	97	203
TLD-M-09	108	203
TLD-M-10	93	203
TLD-M-11	209	203
TLD-M-16	101	203
TLD-M-18	112	203
TLD-M-20	106	203
TLD-M-22	103	203
TLD-M-24	109	203
TLD-M-26	101	203
TLD-M-28	116	203
TLD-M-30	105	203
TLD-M-32	104	203
TLD-M-34	106	203
TLD-M-37	140	203
TLD-M-38	125	203
TLD-M-39	124	203
TLD-M-40	146	203
TLD-M-41	114	203
TLD-M-42	114	203
TLD-M-43	123	203
TLD-M-44	123	203
TLD-M-45	110	203
TLD-M-46	115	203

<sup>a</sup> 1 mrem/yr = .01 millisieverts per year.

<sup>b</sup> Standard includes background of 103 mrem/yr.

*Table 6 (continued). Average Annual Gamma Exposure Rates At and Near the MMTS  
During 1997*

Sampling Location	Gamma Exposure	
	Annual Average (mrem/yr) <sup>a</sup>	DOE Standard (mrem/yr) <sup>b</sup>
Off-Site		
R-M-1-TLD	104	203
R-M-2-TLD	98	203
R-M-3-TLD	131	203
R-M-4-TLD	115	203
R-M-5-TLD	109	203
R-M-6-TLD	104	203
R-M-7-TLD	88	203
R-M-9-TLD	103	203
TLD-M-02	105	203
TLD-M-03	110	203
TLD-M-17	81	203
TLD-M-19	65	203
TLD-M-21	70	203
TLD-M-47	178	203

<sup>a</sup> 1 mrem/yr = .01 millisieverts per year.

<sup>b</sup> Standard includes background of 103 mrem/yr.

The population file used in the dose modeling was compiled from 1990 U.S. Bureau of Census data; the meteorological data file was derived from meteorological data collected at the MMTS during 1997.

*Table 7. Results of MMTS Ambient Lead Monitoring Conducted During 1997<sup>a</sup>*

Station	Second Quarter Lead ( $\mu\text{g}/\text{m}^3$ )	Third Quarter Lead ( $\mu\text{g}/\text{m}^3$ )	Fourth Quarter Lead ( $\mu\text{g}/\text{m}^3$ )	EPA Standard Lead ( $\mu\text{g}/\text{m}^3$ )
AIR-M-1	0.44	0.56	0.54	1.50
AIR-M-3	0.44	0.51	0.58	1.50
AIR-M-5	0.45	0.57	0.58	1.50
AIR-M-6	0.43	0.54	0.55	1.50
AIR-M-7	0.41	0.54	0.53	1.50
AIR-M-8	0.45	0.55	0.53	1.50
AIR-M-8A	0.29	0.52	0.52	1.50
AIR-M-9	0.42	0.53	0.53	1.50

<sup>a</sup> Numbers given in this table are quarterly average concentrations.

### 3.5 Meteorology

Meteorological monitoring was conducted during 1997 at a location approximately 200 meters southwest from the repository (Figure 4). Parameters measured or calculated included wind speed, wind direction, standard deviation of wind direction, temperature, barometric pressure, precipitation, solar radiation, and relative humidity. Table 8 summarizes 1997 weather data for temperature, wind speed, and precipitation.

*Table 8. 1997 Weather Data Summary for the MMTS*

Month	Temperature C° (F°) <sup>a</sup>				Wind Speed KPH (MPH) <sup>b</sup>		Precipitation Totals cm (in.) <sup>c</sup>
	Avg. High	Avg. Low	Max. Temp.	Min. Temp.	Avg.	Peak Gust	
January	3.4 (38.1)	-7.5 (18.5)	12.6 (54.7)	-16.0 (3.1)	17.1 (10.6)	67.1 (41.7)	9.91 (3.90)
February	5.8 (42.5)	-6.8 (19.8)	17.0 (62.6)	-12.9 (8.7)	17.9 (10.6)	65.7 (40.8)	8.00 (3.15)
March	12.8 (55.0)	-2.2 (28.0)	18.3 (65.0)	-13.7 (7.3)	16.3 (10.1)	72.4 (45.0)	3.99 (1.57)
April	12.0 (53.7)	-1.2 (29.8)	20.6 (69.1)	-8.5 (16.7)	15.9 (9.9)	72.4 (45.0)	13.11 (5.16)
May	21.3 (70.3)	6.9 (44.4)	28.9 (84.1)	-0.9 (30.3)	14.6 (9.1)	75.2 (46.7)	13.49 (5.31)
June	25.3 (77.5)	9.7 (49.4)	30.3 (86.6)	5.6 (42.1)	16.1 (10.0)	72.4 (45.0)	1.09 (0.43)
July	28.8 (83.8)	12.7 (54.9)	34.7 (94.4)	8.6 (47.4)	13.8 (8.6)	63.6 (39.5)	11.07 (4.36)
August	26.7 (80.1)	12.6 (54.7)	31.8 (89.2)	9.9 (49.9)	13.0 (8.1)	72.6 (45.1)	6.40 (2.52)
September	23.0 (73.4)	9.9 (49.8)	28.5 (83.3)	5.7 (42.3)	13.8 (8.6)	62.8 (39.0)	8.41 (3.31)
October	15.6 (60.0)	1.1 (34.0)	25.1 (77.2)	-7.1 (19.2)	15.9 (9.9)	73.2 (45.5)	7.29 (2.87)
November	8.3 (46.9)	-3.4 (25.9)	16.8 (62.3)	-10.8 (12.5)	15.1 (9.4)	82.6 (51.3)	2.11 (0.83)
December	2.9 (37.3)	-7.9 (17.8)	8.9 (48.0)	-13.8 (7.1)	15.8 (9.8)	72.4 (45.0)	1.60 (0.63)

<sup>a</sup> C° = degrees Centigrade; F° = degrees Fahrenheit

<sup>b</sup> KPH = kilometers per hour; MPH = miles per hour

<sup>c</sup> cm = centimeters; in. = inches

### 3.6 Surface Water

Montezuma Creek is the primary surface water body in the MMTS area, flowing west to east through the millsite. Typical flow rates are on the order of 1 to 2 cubic feet per second. Flow is generally perennial; however, portions of the creek are seasonally dry some years. Montezuma Creek water is diverted about 1 mile upstream of the millsite for irrigation. Downstream of the millsite, creek water is used for crop irrigation and livestock watering. Other surface water bodies in the MMTS area include several artificial ponds and groundwater seeps.

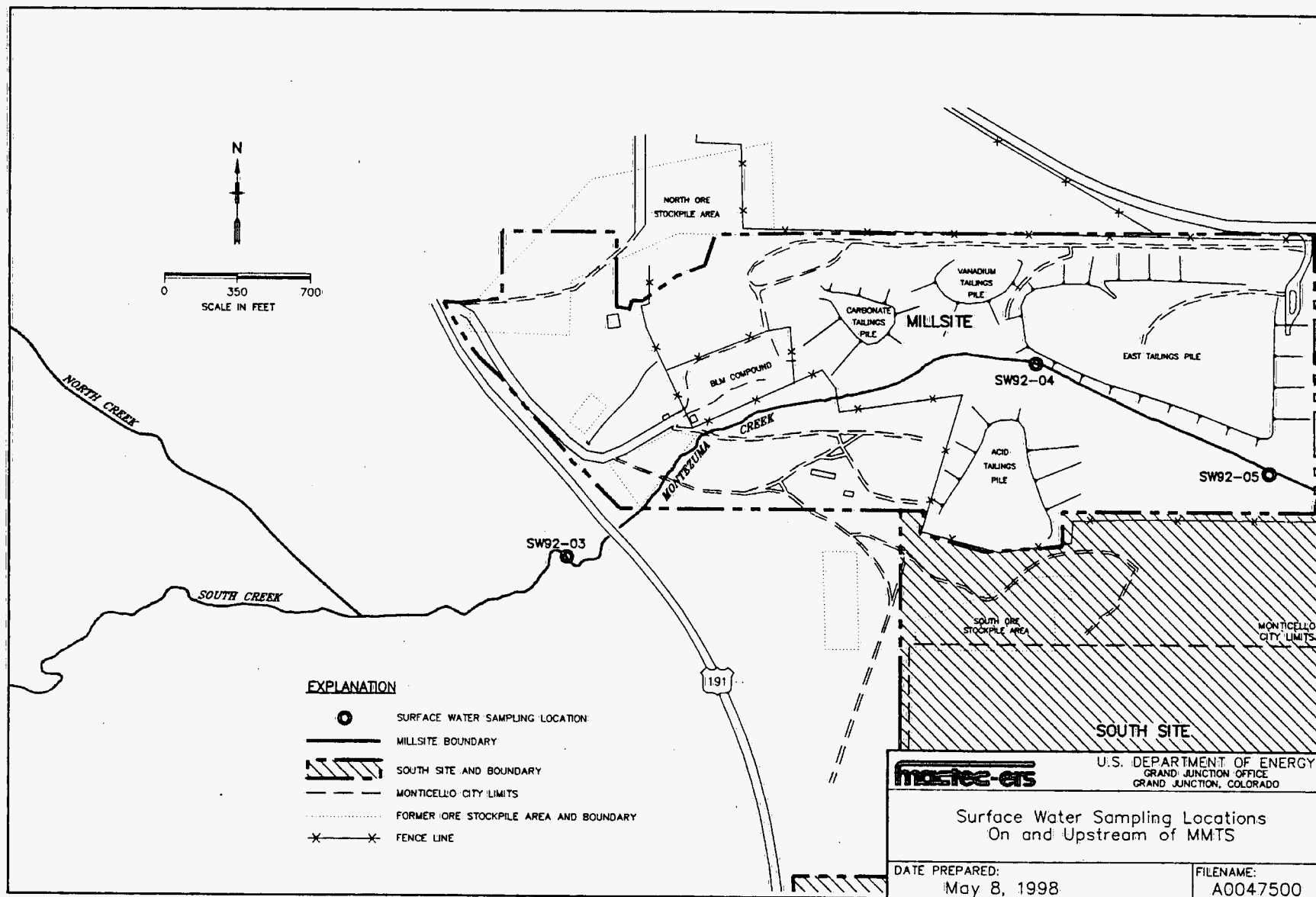
The remedial investigation (RI) study commenced in 1992 and concluded at the end of 1996; the Draft Final *Monticello Mill Tailings Site OU III Remedial Investigation* (DOE 1998c) report has been issued. Therefore, the 1997 surface-water monitoring program at the MMTS involved the start of a post RI, annual monitoring program. A new sampling plan entitled *Annual Monitoring Program* (DOE 1997d) was created to implement the revised sampling strategy. The plan specifies semiannual sampling in April and October commencing in October of 1997. The October sampling event was designed as an extensive sampling event because flows are typically the lowest and analyte concentrations the highest. The April sampling event, which was not conducted in 1997, was designed as a limited sampling event to monitor changes in surface water chemistry downgradient of the millsite in response to millsite remediation. Compared to the 1996 monitoring, the 1997 monitoring included only one upgradient sampling location, which was sampled to monitor for major changes in water quality entering the site. In addition, seeps on and north of the millsite were eliminated from the monitoring program because they were excavated during remediation, and locations furthest downgradient of the millsite (SW92-09 and Montezuma Canyon) were eliminated from the monitoring program because data collected during the remedial investigation indicated that site contaminant concentrations attenuate downgradient of the Sorenson Site.

The objectives of the revised monitoring program were (1) to monitor for major changes in water quality entering the site, (2) to detect changes in water quality of Montezuma Creek in response to millsite remediation, and (3) to verify compliance with State surface-water quality standards. In accordance with the above-stated objectives, surface water samples were collected from the locations listed in Table 9 and shown in Figures 5 and 6. Sampling locations included selected sites along an established network on Montezuma Creek upstream of the millsite, on the millsite, and downstream of the millsite.

Surface water samples collected during 1997 were submitted for laboratory analysis for the constituents listed in Table 9. Alkalinity, pH, electrical conductivity, and temperature were measured in the field at the time of sample collection. The analytical results are displayed in Table A-18 of Appendix A. All surface water samples were collected and analyzed according to standardized, approved methods described in the *Annual Monitoring Program* (DOE 1997d) sampling plan. State of Utah water quality standards are compared to 1996 and historic sample results in Table 10.

*Table 9. 1997 Surface-Water Sampling and Analytical Design Schedule.*

Date	Location	Description	Sites Sampled	Analytes Measured
October 1997	Upgradient	Montezuma Creek Established Site	SW92-03	As, Ca, Cl, Co, Cu, F, Gross $\alpha$ , Gross $\beta$ , K, Mg, Mn, Mo, Na, (NO <sub>2</sub> + NO <sub>3</sub> )-N, Pb, Pb-210, Ra-226, Rn-222, Se, SO <sub>4</sub> , TDS, Th-230, U, V, Zn
	Millsite	Montezuma Creek Established Site	SW92-04, SW92-05	
	Downgradient	Montezuma Creek Established Site	SW92-06, SW92-07, SW92-08, W-4, Sorenson	
	Downgradient	Montezuma Creek Hotspot Study Locations	SW97-01, SW97-02, SW97-03, SW97-04, SW97-05, SW97-05E	As, Ca, Cl, Co, Cu, F, , Mg, Mn, Mo, Na, Pb, Se, SO <sub>4</sub> , TDS, U, V, Zn



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Figure 5. Surface Water Sampling Locations On and Upstream of MMTS

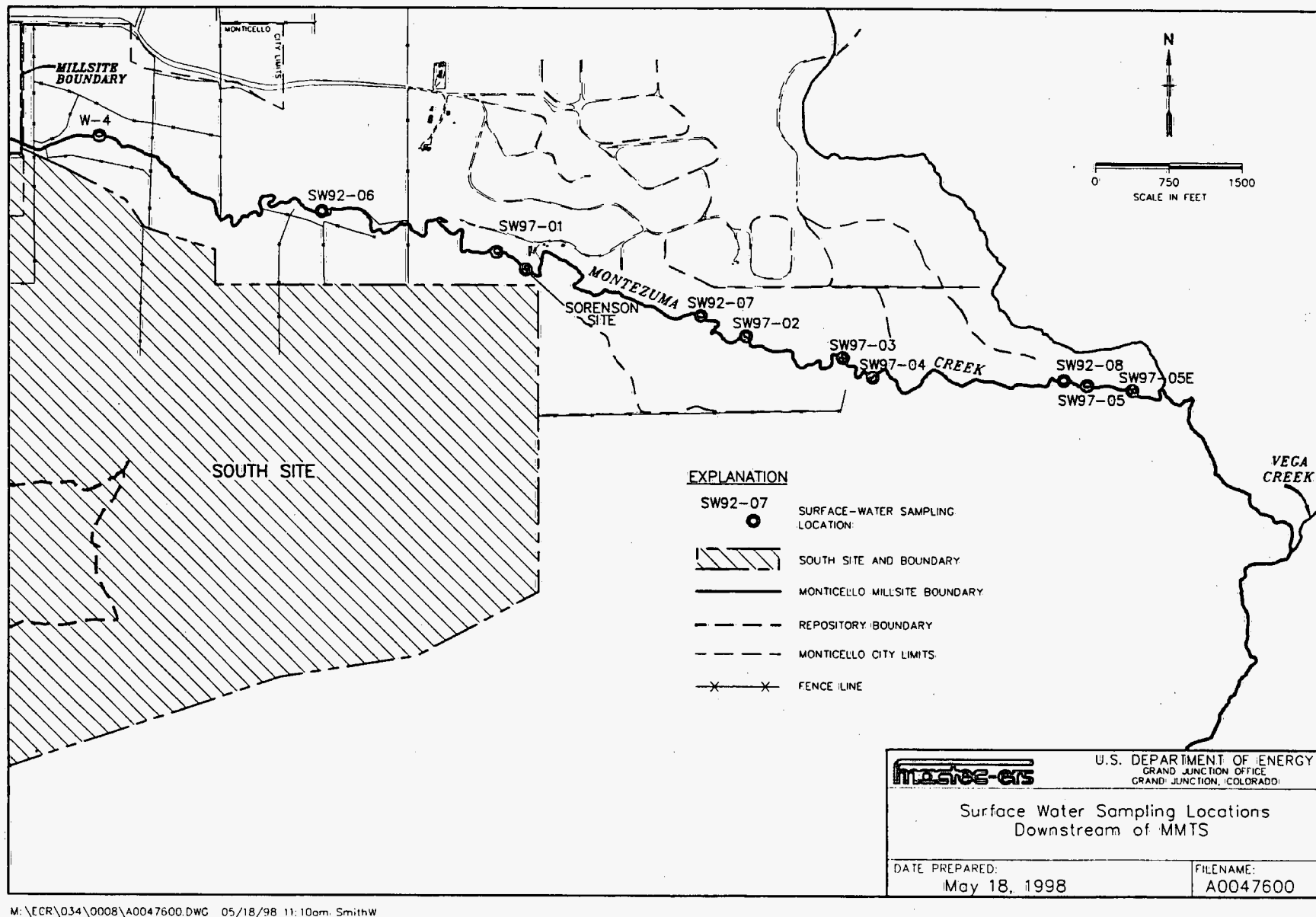


Figure 6. Surface Water Sampling Locations Downstream Of MMTS

**Table 10. Comparison of State of Utah Water Quality Standards<sup>a</sup> with 1997 and Historical Maximum Concentrations in Montezuma Creek**

Constituent	State Standard		1997 Maximum <sup>b,c</sup>			Historical Maximum <sup>b,c,d</sup>		
			Up-Gradient	On Site	Down-Gradient	Up-Gradient	On Site	Down-Gradient
Common Ions								
Fluoride <sup>e</sup>	1.4-2.4	mg/L	-0.195	-0.191	0.261	0.289	-0.197	0.334
Nitrate (as N) <sup>f</sup>	10	mg/L	0.233	0.308	0.433	5.67	2.982	10.007
Total Dissolved Solids	1200	mg/L	1090	1320	1550	1842	1860	1700
Field Measurements								
pH	6.5-9.0		8.15-8.15	7.79-7.81	7.81-8.32	7.2-9.16	6.6-8.67	6.74-9.6
Metals								
Arsenic	0.05	mg/L	<0.0023	<0.0124	<0.0033	<0.0039	<0.0039	0.027
Barium	1.0	mg/L	---	---	---	<0.121	0.1	<0.126
Boron	0.75	mg/L	---	---	---	0.14	<0.0926	0.257
Cadmium	0.01	mg/L	---	---	---	<0.001	<0.001	<0.001
Chromium	0.05	mg/L	---	---	---	<0.0049	<0.006	0.0263
Copper	0.2	mg/L	<0.0033	<0.0022	0.0042	<0.0101	<0.017	0.0515
Iron	1.0	mg/L	---	---	---	2.85	1.34	4.45
Lead	0.05	mg/L	<0.0011	<0.0011	<0.0012	0.0245	<0.0051	0.15
Mercury	0.002	mg/L	---	---	---	<0.0001	<0.0002	<0.0001
Selenium	0.01	mg/L	<0.0022	<0.0022	<0.0022	0.0097	<0.012	0.042
Silver	0.05	mg/L	---	---	---	<0.007	0.0209	<0.001
Radiological								
Gross Alpha	15	pCi/L	<2.13	11.06	<67.68	76	162	517
Gross Beta	50	pCi/L	<8.53	<8.67	<71.05	26.5	48	187
Radium-226+228	5	pCi/L	<0.47	<0.35	<0.4	3.3	0.96	1.6

<sup>a</sup> State of Utah Water Quality Standards for the Montezuma Creek segment. Utah Administrative Code Rule R317-2. Not all state standards are listed in this table.

<sup>b</sup> A "----" indicates no data available; a "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit); a "-" indicates an estimated value.

<sup>c</sup> The values are in units shown under the State Standard column.

<sup>d</sup> Based on maximum concentrations observed from 1984 through 1995.

<sup>e</sup> Allowable maximum concentration varies according to the daily maximum mean air temperature.

<sup>f</sup> Nitrate (as N) was derived using the following conversion, Nitrate (as N) =  $\text{NO}_3 \div 4.427$ .

Analyte concentrations detected in the sample collected from Montezuma Creek upstream of the millsite (SW92-03) were below State standards. Water quality entering the site is consistent with historical water quality as illustrated in the time-versus-concentration graphs shown in Figure 7. On the millsite, total dissolved solids (TDS) concentrations of samples collected from SW92-04 (1,310 mg/L) and SW92-05 (1,320 mg/L) exceeded the TDS standard of 1,200 mg/L.

Among samples collected downstream of the millsite, the TDS standard was exceeded at all locations. The gross alpha standard was exceeded at all downstream locations where it was measured. Concentrations of contaminants downstream of the millsite are consistent with previous years results. Time-versus-concentration graphs for selected analytes from the Sorenson sampling location illustrate the consistency (Figure 8).

In addition to selected sites along the established monitoring network, additional surface water sampling was conducted in conjunction with the semi-annual monitoring task in October to determine if four localized soil contamination "hotspots" in the upper, middle, and lower sections of Montezuma Creek were contributing to increased analyte concentrations in Montezuma Creek. Surface water samples were collected at six new locations so that each hotspot was bracketed with an upstream and downstream sample (Figure 6). Results of the study showed that analyte concentrations downgradient from three of the hotspots located in the upper, middle, and lower Montezuma Creek sections are comparable to analyte concentrations immediately upgradient of the hotspot. Therefore, hotspots are interpreted to have minimal impact on surface water quality at these locations. However, data from the hotspot located furthest west between locations SW92-06 and SW97-01 revealed that uranium and molybdenum concentrations downgradient of the hotspot were elevated compared to the concentrations upgradient of the hotspot. Therefore, the increased analyte concentrations in the creek may be the result of soil contamination in the stretch of Montezuma Creek between SW92-06 and SW97-01 in conjunction with contaminated groundwater discharge into the creek.

A complete description of the surface water, including detailed analysis of the nature and extent of surface water contamination, surface water flow, and groundwater and surface water interaction, is described in the *Monticello Mill Tailings Site OU III Remedial Investigation* (DOE 1998c) report.

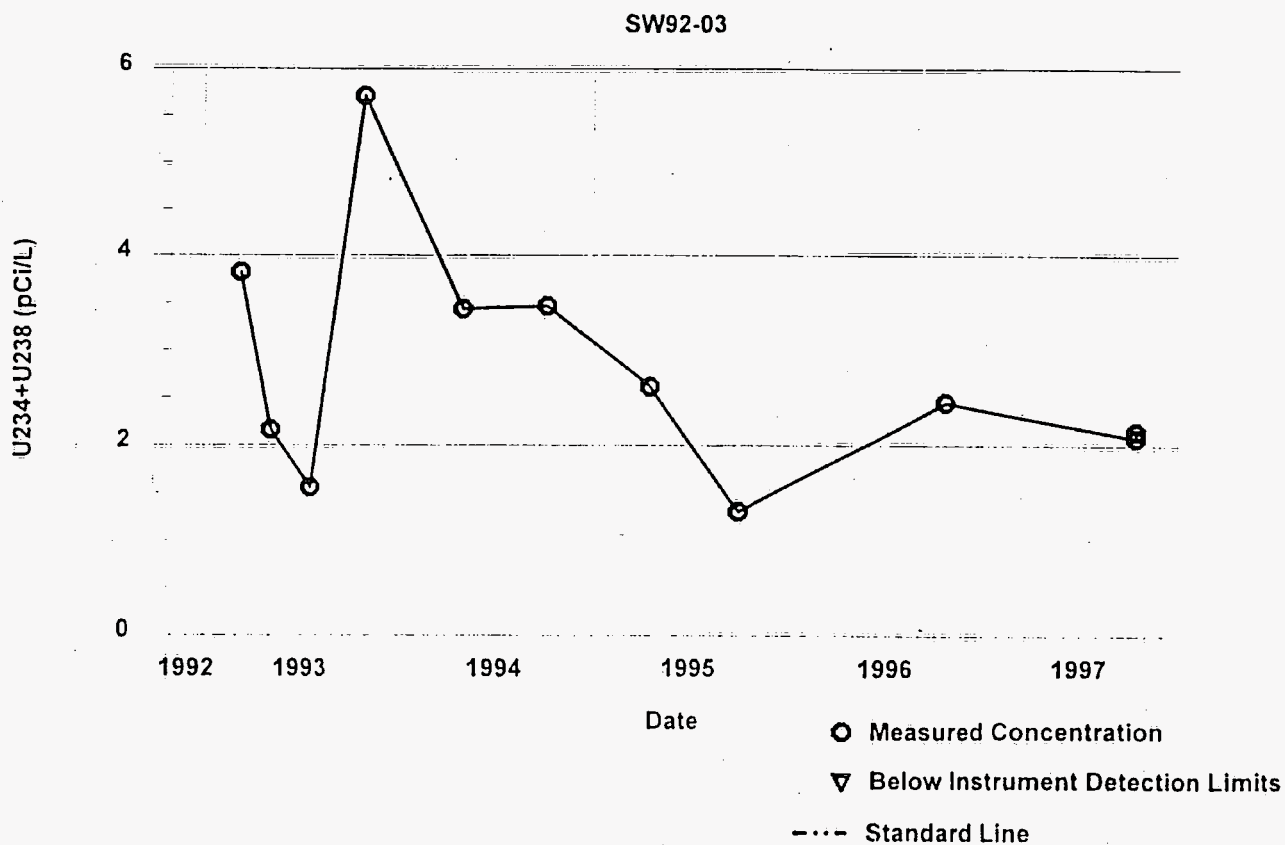
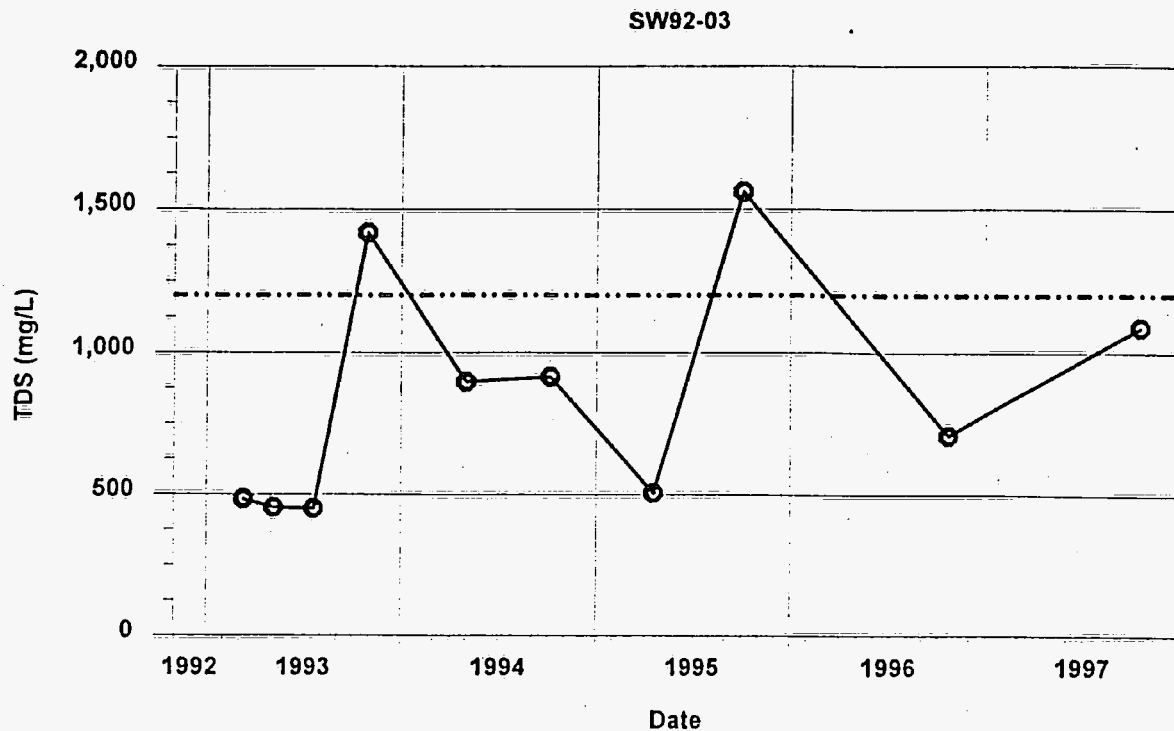
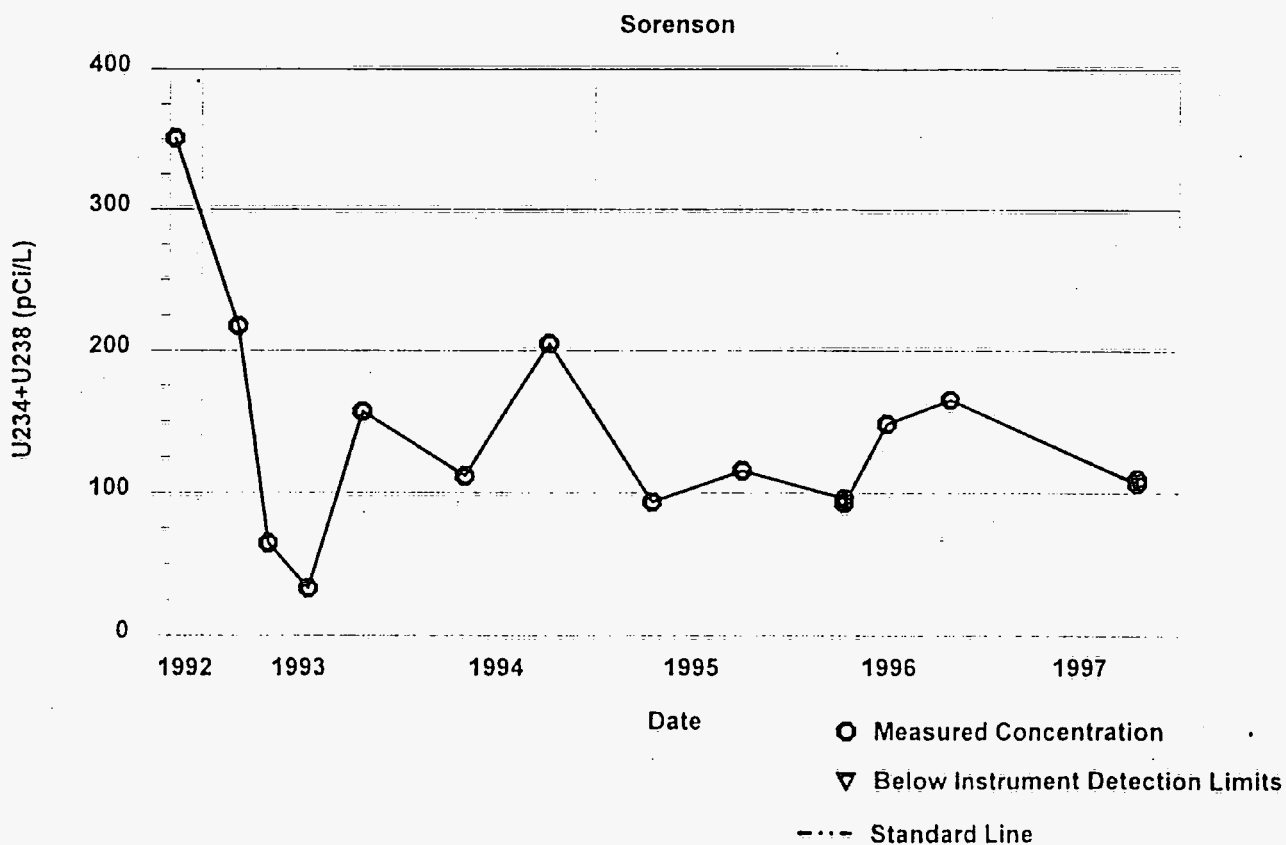
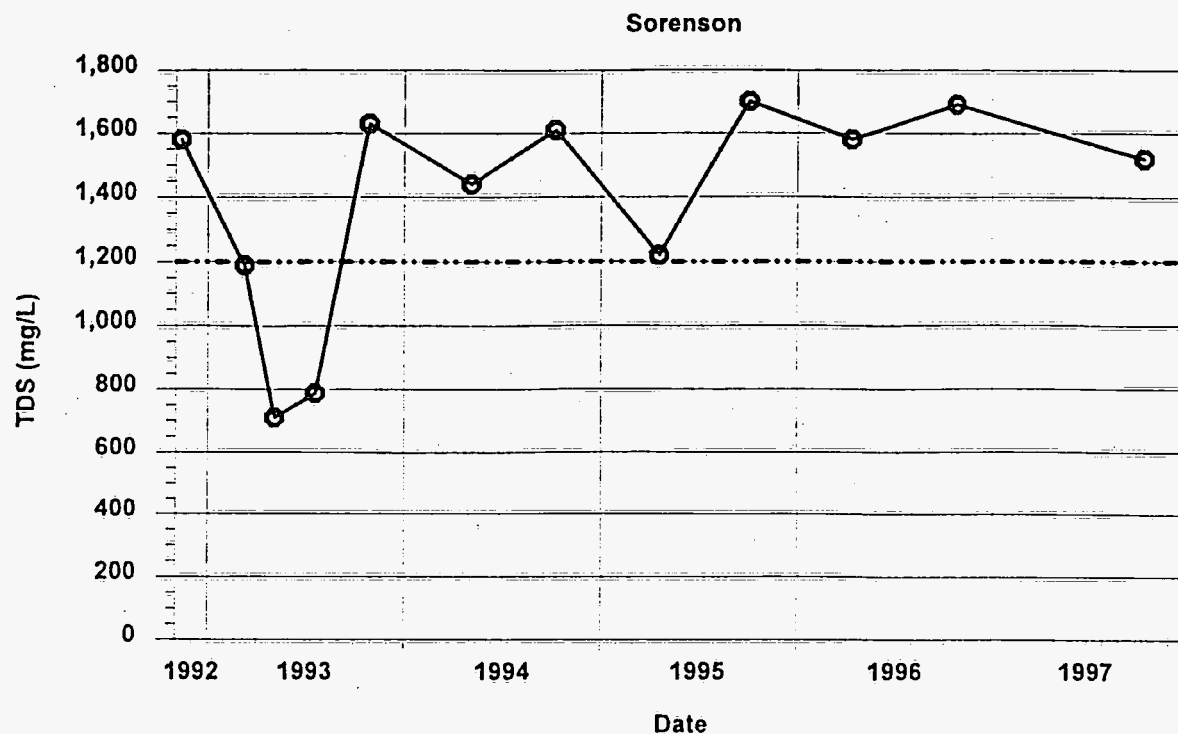


Figure 7. TDS and U-234 + U-238 Concentrations at Surface Water Sampling Location SW92-03



*Figure 8. TDS and U-234 + U-238 Concentrations at Surface Water Sampling Location Sorenson*

### 3.7 Groundwater

The RI study commenced in 1992 and concluded at the end of 1996; the Draft Final *Monticello Mill Tailings Site OU III Remedial Investigation* (DOE 1998c) report has been issued.

Therefore, the 1997 groundwater monitoring program at the MMTS involved the start of a post RI, annual monitoring program. A new sampling plan entitled *Annual Monitoring Program* (DOE 1997d) was created to implement the revised sampling strategy. The plan specifies semiannual sampling in April and October commencing in October of 1997. The October sampling event was designed as an extensive sampling event because flows are typically the lowest and analyte concentrations the highest.

The April sampling event, which was not conducted in 1997, was designed as a limited sampling event to monitor alluvial contaminant plume movement downgradient of the millsite in response to millsite remediation. Specific changes in groundwater locations monitored during 1997 included the following: (1) only one upgradient well cluster (includes one alluvial, one Burro Canyon well, and one Dakota Sandstone well) was sampled to monitor for major changes in groundwater quality entering the site; (2) the number of wells sampled on the millsite was reduced because nearly all wells on the millsite were abandoned or excavated during remediation (only six wells remain); and (3) the number of downgradient alluvial wells sampled was reduced to locations necessary to achieve a good spacial distribution in order to provide good contaminant plume delineation.

The objectives of the revised monitoring program were (1) to monitor the contaminant plume movement within the alluvial aquifer; (2) to determine if water quality within the Burro Canyon aquifer is being degraded by contaminated alluvial groundwater; and (3) to verify compliance with Federal and State groundwater quality standards.

Groundwater sampling in 1997 was conducted in October according to the schedule presented in Table 11, which lists the wells that were sampled and analytes measured for the sampling event. Sampling was conducted using standardized, approved methods specified in the *Annual Monitoring Plan* (DOE 1997d). Field measurements made at each well included alkalinity, electrical conductivity, pH, temperature, and turbidity. Figure 9 shows the sampling locations of on-site and upgradient wells, and Figure 10 shows the sampling locations of downgradient and cross-gradient wells. Analytical results of all 1997 well samples are included in the Appendix A, Table A-19; Quality Assurance (QA) / Quality Control (QC) analytical data for samples collected at or near the MMTS during 1997 are included in Appendix A, Table A-20.

Sample results from upgradient alluvial and Burro Canyon wells were below Federal and State standards. Analyte concentrations measured in upgradient alluvial well 92-05 are consistent with historical results as illustrated in Figure 11. The pH measured at upgradient Dakota Sandstone well (92-13) exceeded the standard (measured value was 9.48 compared to the State standard of 6.5–8.5). With the exception of the pH, analyte concentrations in the sample collected from this well were below Federal and State standards. Maximum concentrations of analytes measured in alluvial wells are listed and compared to Federal and/or State standards and historical maximums in table 12. Concentrations of groundwater analytes that exceeded standards in 1997 are posted for each well in Figures 9 and 10.

Table 11. 1997 Ground-Water Sampling and Analytical Design Schedule.

Date	Location	Formation	Wells Sampled	Analytes Measured
October 1997	Upgradient	Alluvial	92-05	gross <sup>-</sup> , As, gross \$, Ca, Cl, Co, Cu, F, K, Mg, Mn, Mo, Na, (NO <sub>2</sub> + NO <sub>3</sub> )-N, Pb, Pb-210, Ra-226, Rn-222, Se, SO <sub>4</sub> , TDS, Th-230, U-234 <sup>1</sup> , U-235 <sup>1</sup> , U-238 <sup>1</sup> , U, V, Zn
		Burro Canyon	92-06	
		Dakota Sandstone	92-13	
	Millsite	Alluvial	82-20, 31SW93-200-4	
		Burro Canyon	93-01, 31SW93-200-1	
		Dakota Sandstone	31SW93-200-2	
		Mancos Shale	31SW93-200-3	
	Downgradient	Alluvial	82-07, 88-85, 92-09, 92-11, 95-01, 95-03	
		Burro Canyon	83-70, 92-10, 95-02, 95-04, 95-06, 95-08	
		Dakota Sandstone	92-12	
	Crossgradient	Burro Canyon	31NE93-205	
		Dakota Sandstone	95-07	

<sup>1</sup> Isotopic uranium analyses were conducted on samples from bedrock wells and 95 series alluvial wells only.

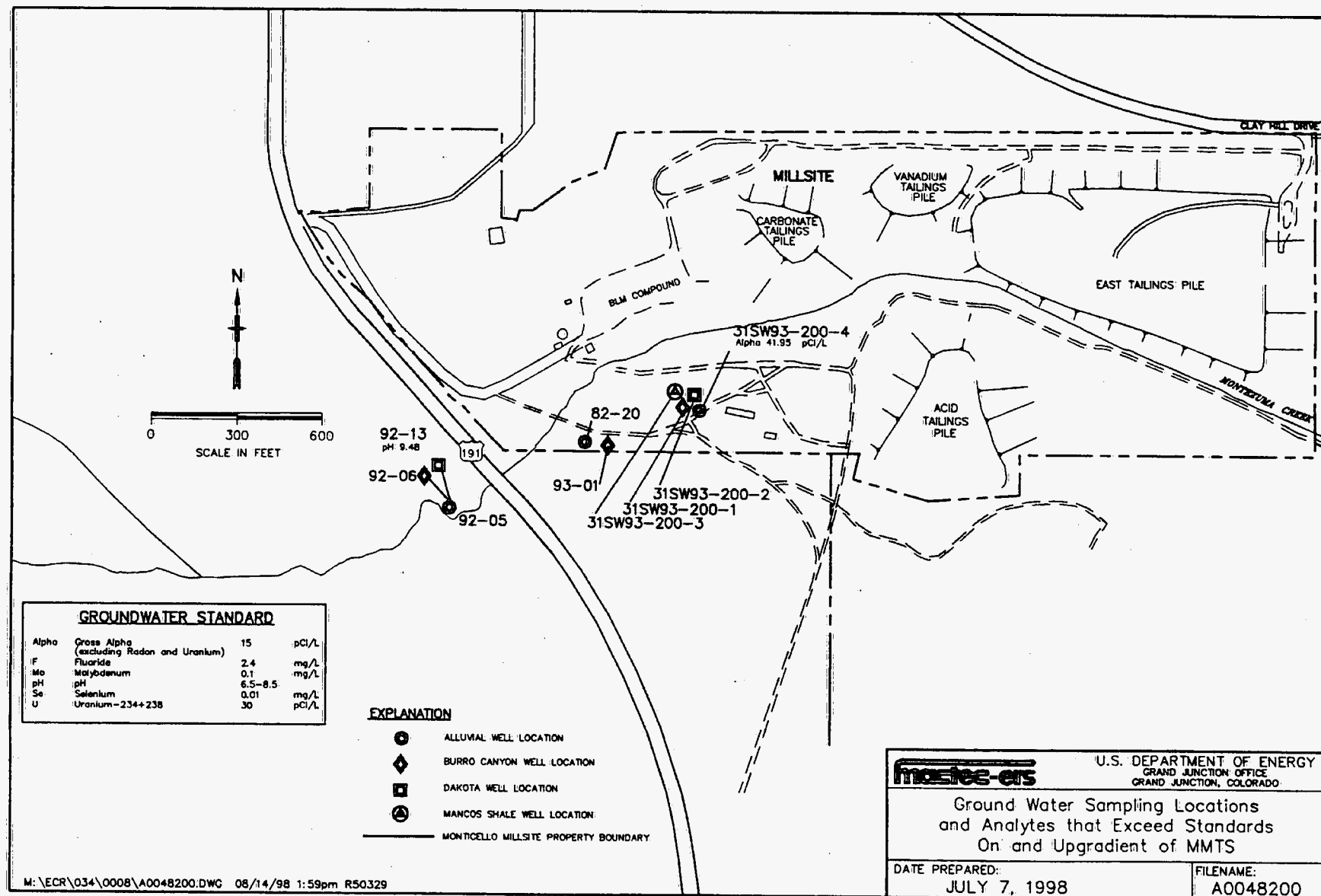


Figure 9. Groundwater Sampling Locations and Analytes that Exceed Standards On and Upgradient of MMTS

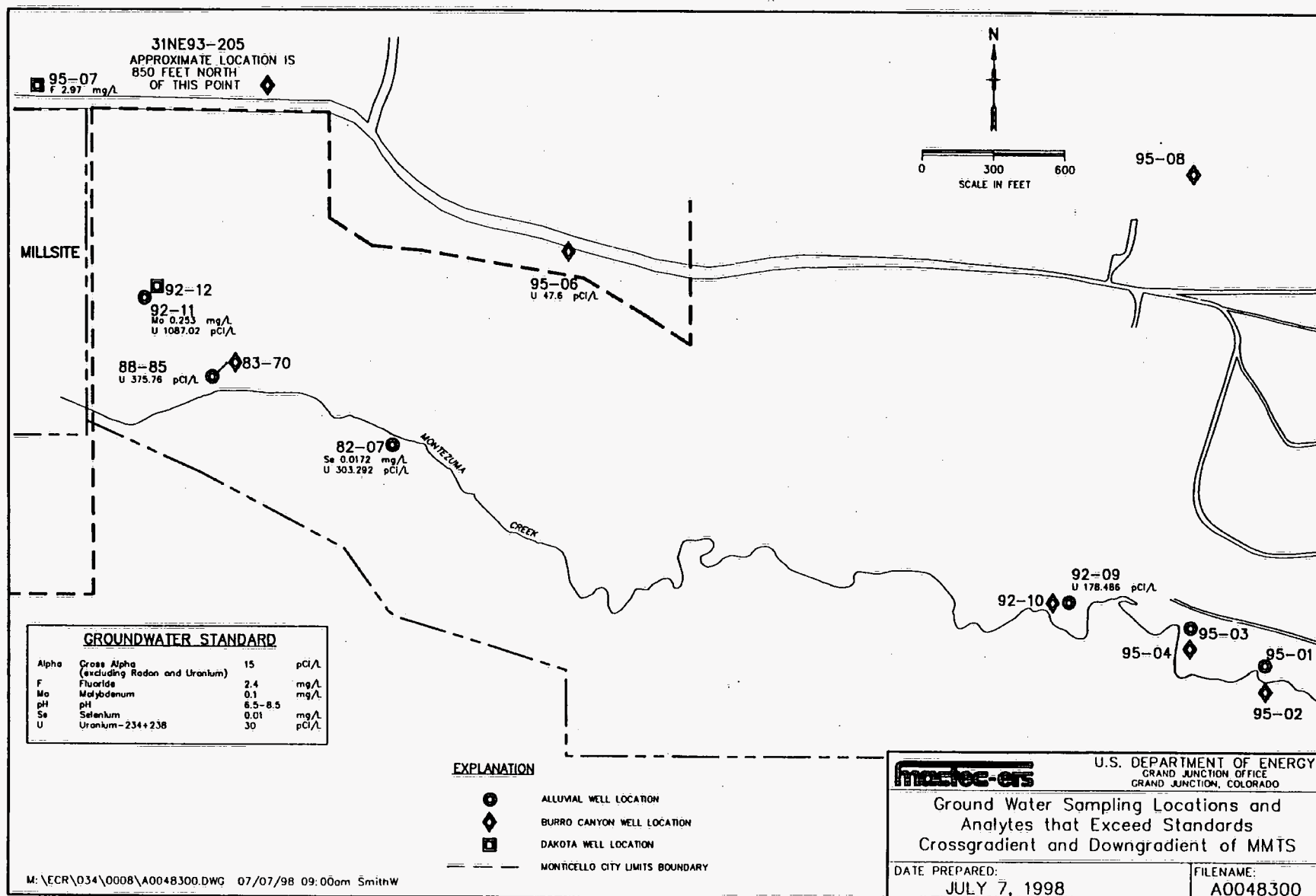


Figure 10. Groundwater Sampling Locations and Analytes that Exceed Standards Crossgradient and Downgradient of MMTS

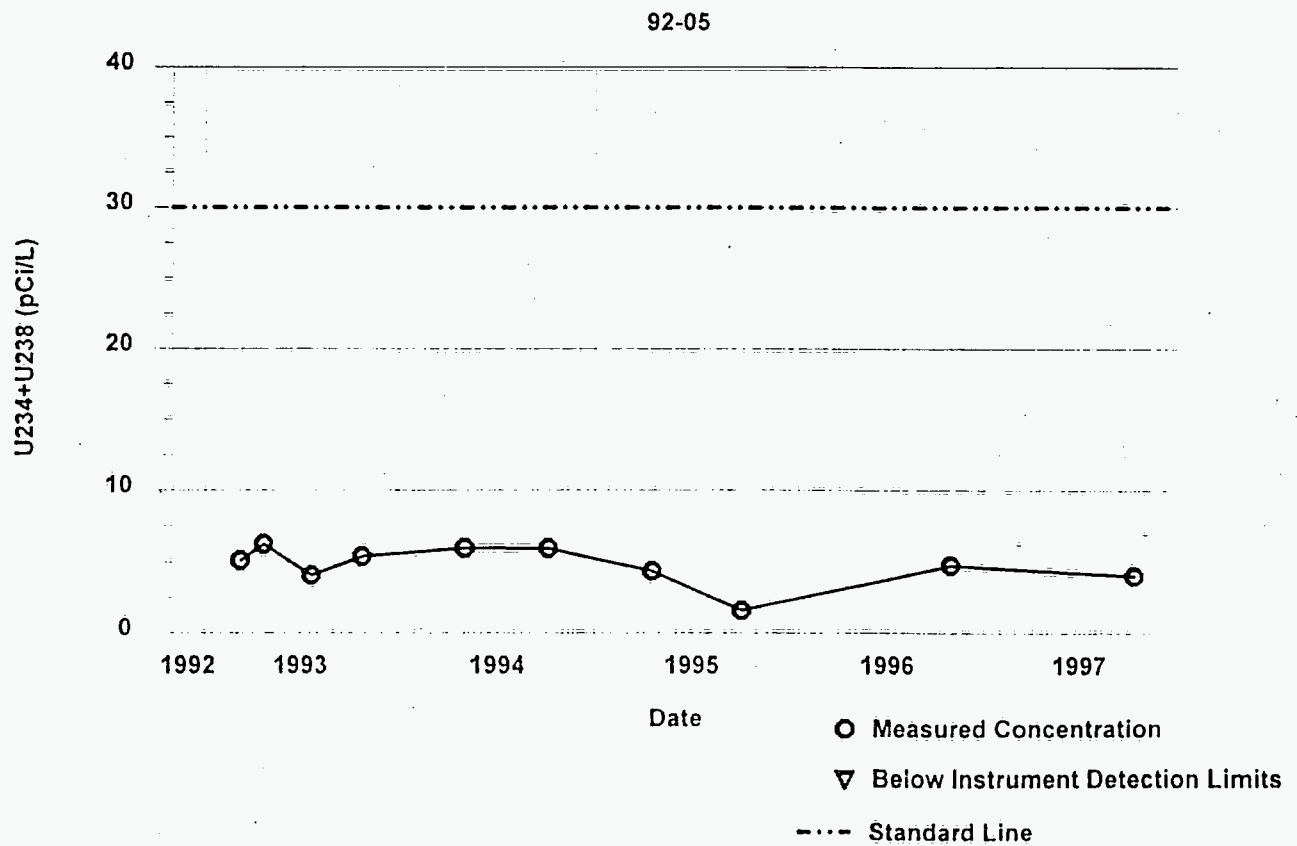
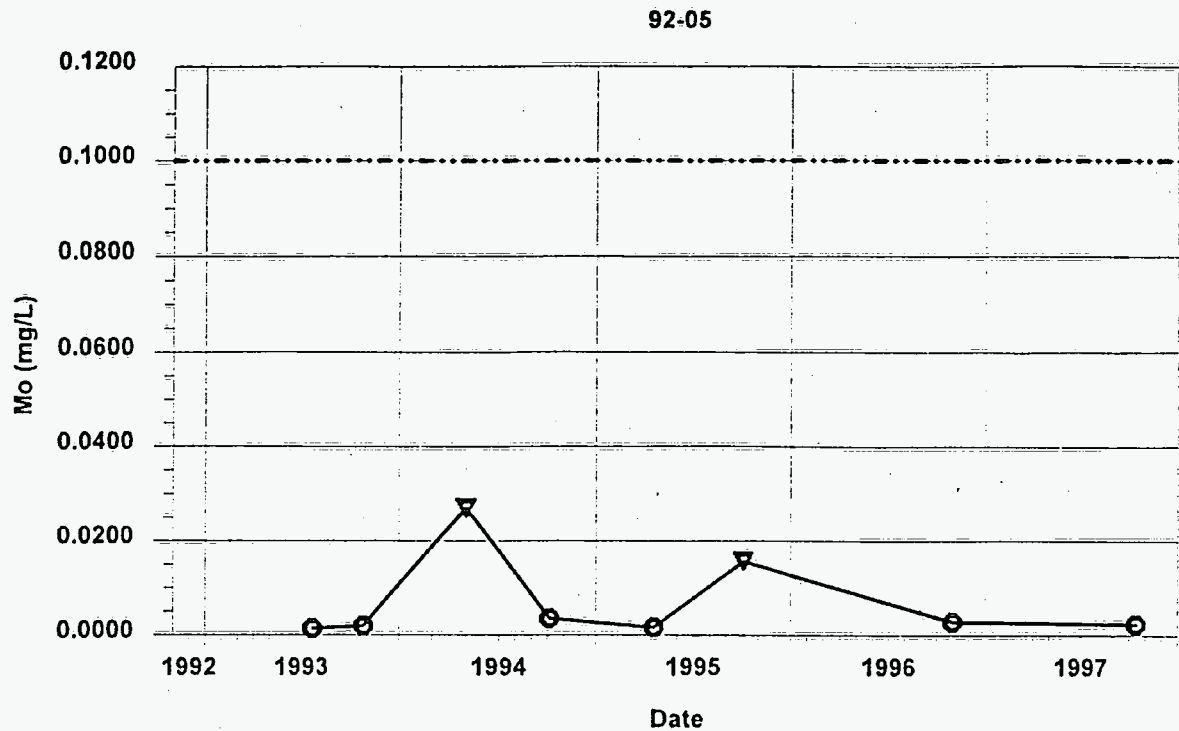


Figure 11. Molybdenum and U-234 + U-238 Concentrations at Well 92-05

**Table 12. Comparison of Federal<sup>a</sup> and State of Utah<sup>b</sup> Groundwater Quality Standards with 1997 and Historical Maximum Concentrations in Alluvial Aquifer<sup>c</sup>**

Constituent	Federal/State Standard		1997 Maximum <sup>d</sup>			Historical Maximum <sup>d,e</sup>		
			Up- Gradient	On Site	Down- Gradient	Up- Gradient	On Site	Down- Gradient
Common Ions								
Fluoride	2.4	mg/L	~0.148	0.256	0.625	0.287	5.66	0.936
Nitrate (as N) <sup>f</sup>	10.0	mg/L	0.738	1.49	3.47	4.721	263	33.308
Field Measurements								
pH	6.5-8.5		6.87-6.87	6.72-6.79	6.62-7.12	6.37-7.32	6.0-9.25	6.0-8.8
Metals								
Arsenic	0.05	mg/L	~0.0108	0.0052	~0.0395	~0.0036	1.104	0.054
Barium	1.0	mg/L	---	---	---	~0.074	0.85	1.000
Cadmium	0.01	mg/L	---	---	---	<0.001	0.005	0.005
Chromium	0.05	mg/L	---	---	---	<0.006	0.037	0.01
Copper	1.0	mg/L	0.0043	0.0043	0.0056	0.0652	0.174	0.0285
Lead	0.05	mg/L	<0.0011	0.0011	<0.0011	0.0032	~0.0229	0.0248
Mercury	0.002	mg/L	---	---	---	<0.0001	0.0023	<0.001
Molybdenum	0.1	mg/L	0.0024	0.0056	0.253	~0.0036	34.2	0.53
Selenium	0.01	mg/L	<0.0022	0.0038	0.0172	~0.0051	0.402	~0.169
Silver	0.05	mg/L	---	---	---	<0.007	~0.0067	0.152
Zinc	5.0	mg/L	<0.002	0.0573	0.034	0.0297	5.02	0.47
Radiological								
Gross Alpha (excluding Radon & Uranium) <sup>g</sup>	15	pCi/L	<10.29	42.5	8.44	<77	~4318.9	873.31
Radium-226+228	5	pCi/L	<0.34	<0.43	3.18	0.56	44	3.19
Uranium-234+238 <sup>h</sup>	30	pCi/L	4.0931	15.3	1087.02	8.48 <sup>i</sup>	8588.8	2281.4

<sup>a</sup> Standards from the Uranium Mill Tailings Radiation Control Act, revised in 1986.

<sup>b</sup> State of Utah Ground Water Quality Standards, Title 26, Chapter 11, Utah Code Annotated. Not all State standards are listed in this table.

<sup>c</sup> A "---" indicates no data available; a "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit); a "~" indicates an estimated value.

<sup>d</sup> The values are in units shown under the Federal/State Standard column.

<sup>e</sup> Based on maximum concentrations observed from 1984 through 1996.

<sup>f</sup> Nitrate (as N) was derived using the following conversion: nitrate (as N) =  $\text{NO}_3^- \div 4.427$ .

<sup>g</sup> Measured values represent total gross alpha minus uranium activity. Uranium concentrations, which were measured in milligrams per liter, were converted to picocuries per liter. This conversion assumes equilibrium and an activity of 0.687 picocuries per microgram (pCi/ $\mu\text{g}$ ).

<sup>h</sup> Total uranium concentrations, which were measured in milligrams per liter, were converted to Uranium-234+238 in picocuries per liter for comparison purposes. This conversion assumes equilibrium and an activity of 0.671 picocuries per microgram (pCi/ $\mu\text{g}$ ).

<sup>i</sup> Extreme-values testing of uranium results from samples collected in 1993 indicated that a value (155.03 pCi/L) was an outlier; this value from an upgradient well was not included in this table.

All six wells remaining on the millsite were sampled in October (Figure 9). These wells are upgradient of the tailings piles and generally reflect background water quality. Sample concentrations from these wells were below State and Federal standards, with the exception of the sample from alluvial well 31SW93-200-4 that exceeded the gross alpha standard.

Samples from downgradient alluvial wells provide evidence of off-site migration of contaminants. In 1997, the standards for molybdenum, selenium, and uranium-234 + 238 were exceeded in samples from one or more downgradient alluvial wells (Figure 10). Results from this sampling round are consistent with historical results as shown in Figures 12 and 13.

The uranium-234 + 238 concentration from Burro Canyon well 95-06 (47.6 pCi/L) exceeded the standard (30 pCi/L). However, as explained in the *Monticello Mill Tailings Site OU III Remedial Investigation* (DOE 1998c) report, elevated concentrations of isotopic uranium observed in the Burro Canyon aquifer at this location have been attributed to naturally occurring uranium, rather than contamination associated with uranium mill tailings. All other analyte concentrations measured in downgradient and cross-gradient Burro Canyon wells were below applicable standards. Results from downgradient Dakota Sandstone well 92-12 were below applicable standards, while the sample from cross-gradient Dakota Sandstone well 95-07 exceeded the fluoride standard.

A complete description of the groundwater, including detailed analysis of the nature and extent of groundwater contamination, groundwater flow, contaminant transport, and groundwater and surface water interaction, is described in the *Monticello Mill Tailings Site OU III Remedial Investigation* (DOE 1998c) report.

### 3.8 Biota

A bird survey was conducted in spring 1997 to document the presence or absence of two endangered bird species, the southwestern willow flycatcher and peregrine falcon. The survey was conducted along Montezuma Creek in OU I and OU III. Neither of the species was found. This information was included in the *Biological Assessment of Monticello Mill Tailings Site Remedial Activities* (DOE 1998a), which was submitted to the U.S. Fish and Wildlife Service as part of DOE's Section 7 consultation (see Section 2.1.11 of Compliance Summary).

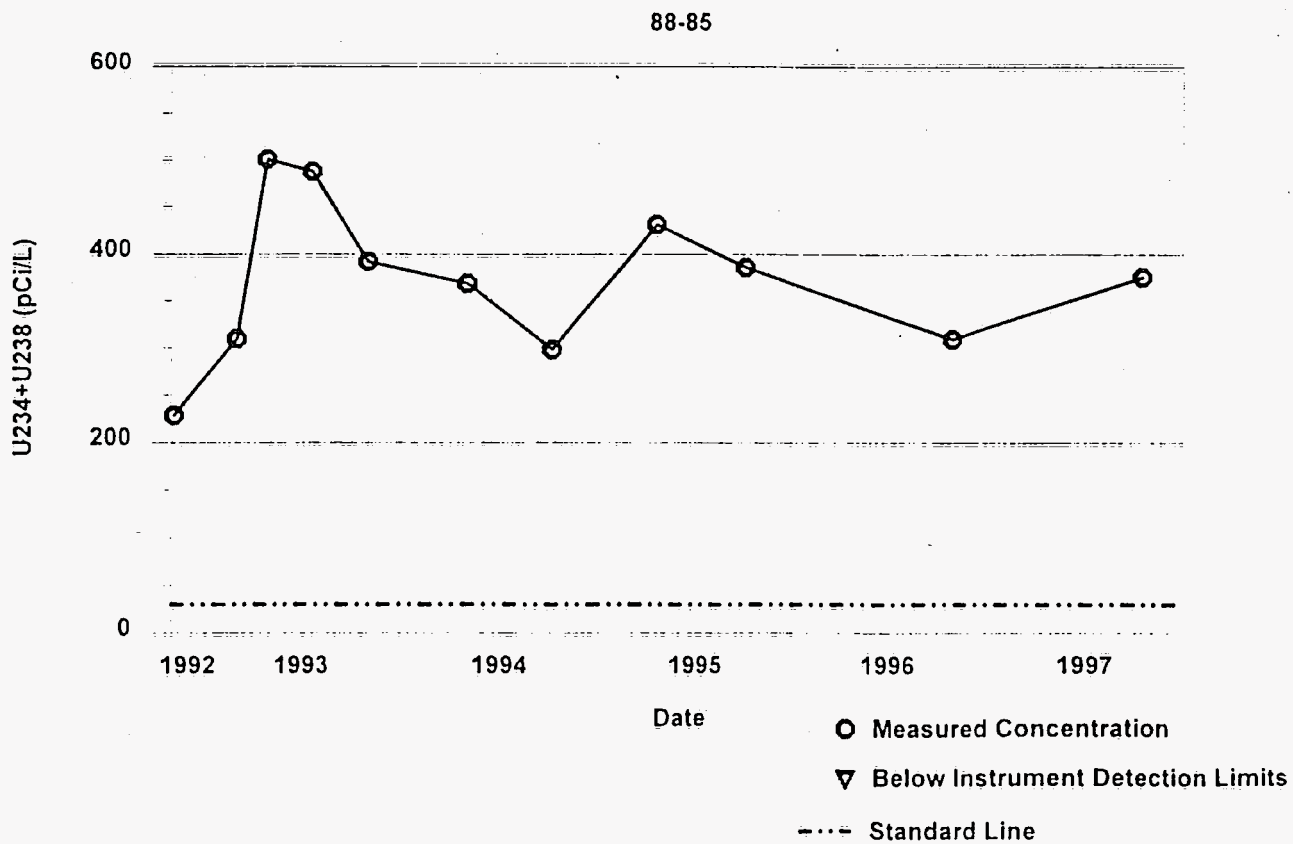
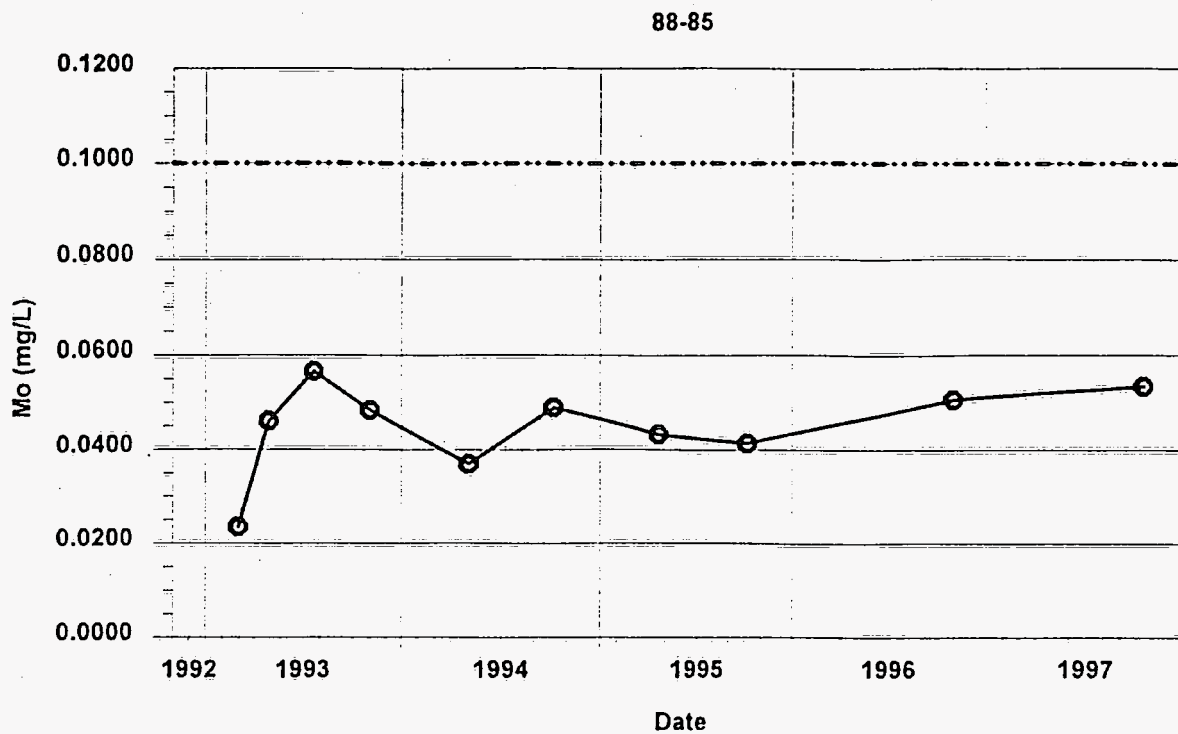


Figure 12. Molybdenum and U-234 + U-238 Concentrations at Well 88-85.

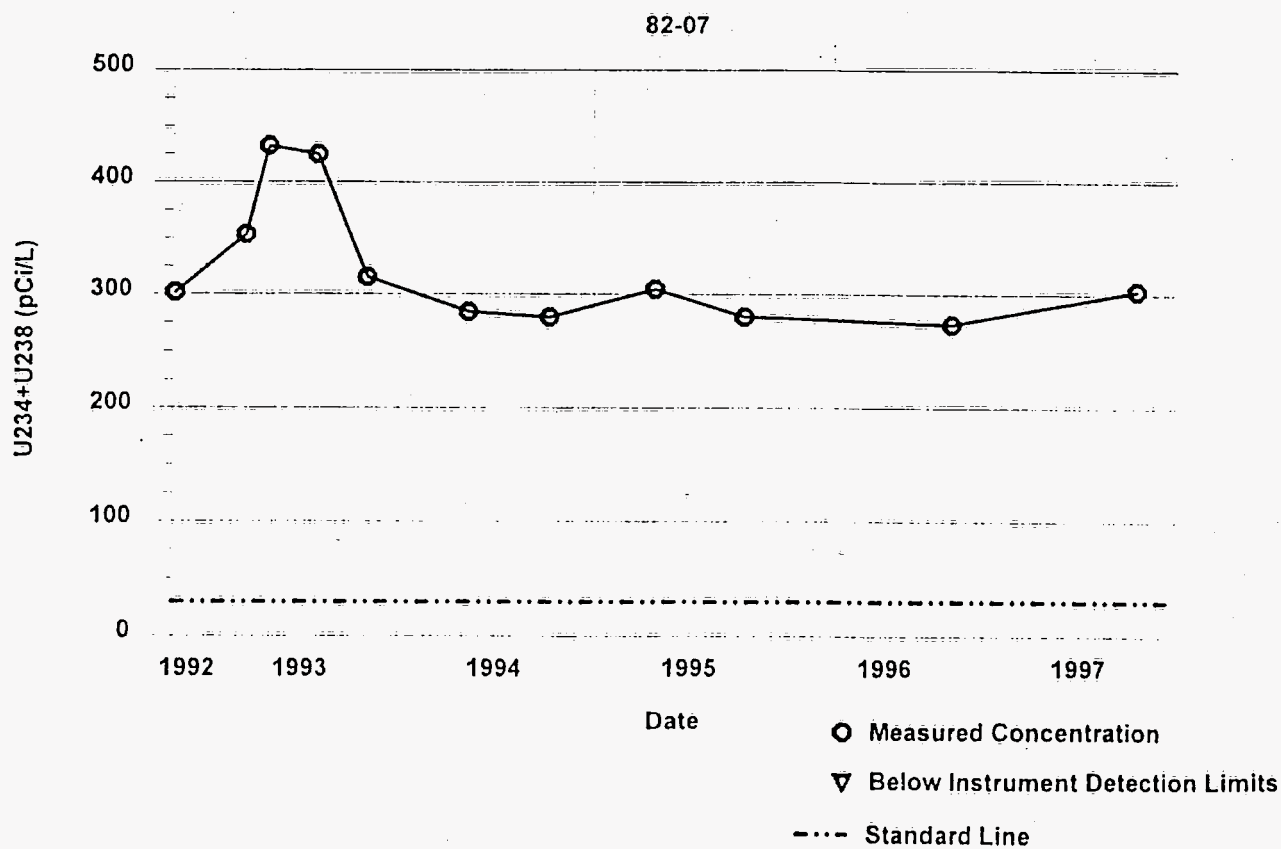
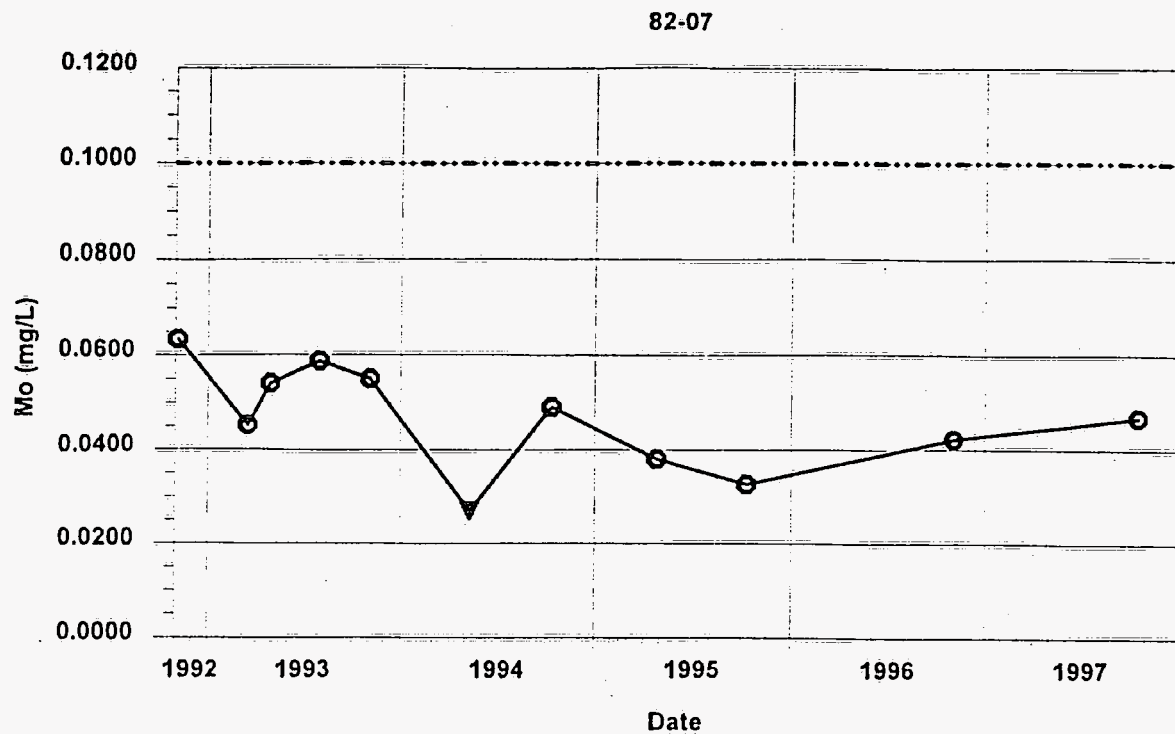


Figure 13. Molybdenum and U-234 + U-238 Concentrations at Well 82-07.

## 4.0 References

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## **Appendix A**

*Table A-1. Radon Data for Monticello, First Quarter 1997*  
*(date installed: 01/07/1997; date removed: 04/08/1997)*

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
R-M-1-RN	4175502	<0.3	<3E-10
R-M-1-RN	4175652	<0.3	<3E-10
R-M-2-RN	4175614	<0.3	<3E-10
R-M-2-RN	4175644	<0.3	<3E-10
R-M-3-RN	4175486	<0.3	<3E-10
R-M-3-RN	4175640	<0.3	<3E-10
R-M-4-RN	4175555	<0.3	<3E-10
R-M-4-RN	4175606	<0.3	<3E-10
R-M-5-RN	4175411	<0.3	<3E-10
R-M-5-RN	4175579	<0.3	<3E-10
R-M-6-RN	4170532	0.4	4E-10
R-M-6-RN	4175401	<0.3	<3E-10
R-M-7-RN	4175509	<0.3	<3E-10
R-M-7-RN	4175600	<0.3	<3E-10
R-M-8-RN	4140440	0.4	4E-10
R-M-8-RN	4175427	<0.3	<3E-10
R-M-9-RN	4175651	<0.3	<3E-10
R-M-9-RN	4175653	<0.3	<3E-10
R-M-10-RN	4175565	<0.3	<3E-10
R-M-10-RN	4175575	<0.3	<3E-10
R-M-11-RN	4175485	0.5	5E-10
R-M-11-RN	4175546	0.4	4E-10
RN-M-04	4175527	0.4	4E-10
RN-M-04	4175571	0.4	4E-10
RN-M-06	4175522	<0.3	<3E-10
RN-M-06	4175617	<0.3	<3E-10
RN-M-07	4175498	1.1	1.1E-09
RN-M-07	4175554	1.0	1.0E-09
RN-M-10	4175480	<0.3	<3E-10
RN-M-10	4175560	<0.3	<3E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

*Table A-1 (continued). Radon Data for Monticello, First Quarter 1997*  
*(date installed: 01/07/1997; date removed: 04/08/1997)*

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
RN-M-11	4175470	<0.3	<3E-10
RN-M-11	4175595	<0.3	<3E-10
RN-M-13	4175419	<0.3	<3E-10
RN-M-13	4175425	<0.3	<3E-10
RN-M-14	4175547	0.4	4E-10
RN-M-14	4175574	<0.3	<3E-10
RN-M-15	4175519	<0.3	<3E-10
RN-M-15	4175628	<0.3	<3E-10
RN-M-16	4175534	<0.3	<3E-10
RN-M-16	4175550	<0.3	<3E-10
RN-M-17	4175445	<0.3	<3E-10
RN-M-17	4175516	<0.3	<3E-10
RN-M-18	4175609	<0.3	<3E-10
RN-M-18	4175645	<0.3	<3E-10
RN-M-19	4175268	<0.3	<3E-10
RN-M-19	4175525	<0.3	<3E-10
RN-M-20	4175314	<0.3	<3E-10
RN-M-20	4175500	<0.3	<3E-10
RN-M-21	4140410	<0.3	<3E-10
RN-M-21	4175273	<0.3	<3E-10
RN-M-22	4175520	<0.3	<3E-10
RN-M-22	4175577	<0.3	<3E-10
RN-M-23	4175538	<0.3	<3E-10
RN-M-23	4175654	<0.3	<3E-10
RN-M-24	4175284	<0.3	<3E-10
RN-M-24	4175548	<0.3	<3E-10
RN-M-25	4175423	<0.3	<3E-10
RN-M-25	4175604	<0.3	<3E-10
RN-M-26	4175507	<0.3	<3E-10
RN-M-26	4175647	<0.3	<3E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

*Table A-1 (continued). Radon Data for Monticello, First Quarter 1997  
(date installed: 01/07/1997; date removed: 04/08/1997)*

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
RN-M-27	4175422	<0.3	<3E-10
RN-M-27	4175523	<0.3	<3E-10
RN-M-28	4175424	<0.3	<3E-10
RN-M-28	4175518	<0.3	<3E-10
RN-M-29	4175282	<0.3	<3E-10
RN-M-29	4175599	<0.3	<3E-10
RN-M-30	4175593	<0.3	<3E-10
RN-M-30	4175620	<0.3	<3E-10
RN-M-31	4175417	<0.3	<3E-10
RN-M-31	4175529	<0.3	<3E-10
RN-M-32	4175524	<0.3	<3E-10
RN-M-32	4175582	<0.3	<3E-10
RN-M-33	4175497	<0.3	<3E-10
RN-M-33	4175596	<0.3	<3E-10
RN-M-34	4175630	<0.3	<3E-10
RN-M-34	4175638	<0.3	<3E-10
RN-M-35	4175412	<0.3	<3E-10
RN-M-35	4175570	<0.3	<3E-10
RN-M-36	4175487	<0.3	<3E-10
RN-M-36	4175568	<0.3	<3E-10
RN-M-37	4175578	<0.3	<3E-10
RN-M-37	4175642	<0.3	<3E-10
RN-M-38	4175535	<0.3	<3E-10
RN-M-38	4175655	<0.3	<3E-10
RN-M-39	4175533	<0.3	<3E-10
RN-M-39	4175576	<0.3	<3E-10
RN-M-40	4175281	0.5	5E-10
RN-M-40	4175544	0.4	4E-10
RN-M-41	4175510	<0.3	<3E-10
RN-M-41	4175532	<0.3	<3E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

*Table A-1 (continued). Radon Data for Monticello, First Quarter 1997  
(date installed: 01/07/1997; date removed: 04/08/1997)*

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
RN-M-42	4175569	<0.3	<3E-10
RN-M-42	4175629	<0.3	<3E-10
RN-M-43	4175605	<0.3	<3E-10
RN-M-43	4175611	<0.3	<3E-10
RN-M-44	4175515	<0.3	<3E-10
RN-M-44	4175580	<0.3	<3E-10
RN-M-45	4175603	<0.3	<3E-10
RN-M-45	4175648	<0.3	<3E-10
RN-M-46	4175505	<0.3	<3E-10
RN-M-46	4175553	<0.3	<3E-10
RN-M-47	4175526	<0.3	<3E-10
RN-M-47	4175573	<0.3	<3E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

*Table A-2. Radon Data for Monticello, Second Quarter 1997*  
*(date installed: 04/08/1997; date removed: 07/01/1997)*

Sample Location	Detector Number	Radon Concentration	
		----- (pCi/L)	( $\mu$ Ci/mL)
R-M-1-RN	4228380	0.4	4E-10
R-M-1-RN	4228417	0.5	5E-10
R-M-2-RN	4228415	0.5	5E-10
R-M-2-RN	4228462	0.6	6E-10
R-M-3-RN	4228322	0.4	4E-10
R-M-3-RN	4228474	0.6	6E-10
R-M-4-RN	4228459	0.6	6E-10
R-M-4-RN	4228501	<0.4	<4E-10
R-M-5-RN	4228444	0.4	4E-10
R-M-5-RN	4228451	0.5	5E-10
R-M-6-RN	4228437	0.6	6E-10
R-M-6-RN	4228573	<0.4	<4E-10
R-M-7-RN	4228314	0.5	5E-10
R-M-7-RN	4228456	<0.4	<4E-10
R-M-8-RN	4228518	0.6	6E-10
R-M-8-RN	4228533	0.5	5E-10
R-M-9-RN	4228406	0.5	5E-10
R-M-9-RN	4228424	0.8	8E-10
R-M-11-RN	4228440	1.2	1.2E-09
R-M-11-RN	4228489	1.1	1.1E-09
RN-M-04	4228384	0.9	9E-10
RN-M-04	4228401	1.2	1.2E-09
RN-M-06	4228388	1.3	1.3E-09
RN-M-06	4228457	0.7	7E-10
RN-M-07	4228402	1.4	1.4E-09
RN-M-07	4228428	1.9	1.9E-09
RN-M-08	4228442	0.8	8E-10
RN-M-08	4228497	0.6	6E-10
RN-M-09	4228300	0.8	8E-10
RN-M-09	4228357	1.0	1.0E-09
RN-M-10	4228299	<0.4	<4E-10
RN-M-10	4228403	<0.4	<4E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = "x 10<sup>-10</sup>".

Table A-2 (continued). Radon Data for Monticello, Second Quarter 1997  
(date installed: 04/08/1997; date removed: 07/01/1997)

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
RN-M-11	4228434	<0.4	<4E-10
RN-M-11	4228436	0.5	5E-10
RN-M-13	4228439	0.6	6E-10
RN-M-13	4228492	0.5	5E-10
RN-M-14	4228393	<0.4	<4E-10
RN-M-14	4228426	<0.4	<4E-10
RN-M-15	4228433	0.4	4E-10
RN-M-15	4228447	<0.4	<4E-10
RN-M-16	4228397	0.6	6E-10
RN-M-16	4228430	0.6	6E-10
RN-M-18	4228391	0.5	5E-10
RN-M-18	4228419	0.7	7E-10
RN-M-20	4228386	0.5	5E-10
RN-M-20	4228508	0.6	6E-10
RN-M-22	4228431	0.4	4E-10
RN-M-22	4228527	0.4	4E-10
RN-M-24	4228407	1.1	1.1E-09
RN-M-24	4228517	<0.4	<4E-10
RN-M-26	4228400	0.7	7E-10
RN-M-26	4228405	0.8	8E-10
RN-M-28	4228485	0.6	6E-10
RN-M-28	4228519	0.6	6E-10
RN-M-30	4228408	0.8	8E-10
RN-M-30	4228425	0.9	9E-10
RN-M-32	4228435	0.7	7E-10
RN-M-32	4228448	0.5	5E-10
RN-M-34	4228385	<0.4	<4E-10
RN-M-34	4228510	0.6	6E-10
RN-M-37	4228418	1.0	1.0E-09
RN-M-37	4228452	<0.4	<4E-10
RN-M-38	4228404	<0.4	<4E-10
RN-M-38	4228443	0.4	4E-10
RN-M-39	4228410	0.8	8E-10
RN-M-39	4228412	0.4	4E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

*Table A-2 (continued). Radon Data for Monticello, Second Quarter 1997  
(date installed: 04/08/1997; date removed: 07/01/1997)*

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
RN-M-40	4228429	0.7	7E-10
RN-M-40	4228500	0.9	9E-10
RN-M-41	4228396	0.6	6E-10
RN-M-41	4228450	0.8	8E-10
RN-M-42	4228392	0.6	6E-10
RN-M-42	4228460	0.8	8E-10
RN-M-43	4228383	0.8	8E-10
RN-M-43	4228387	<0.4	<4E-10
RN-M-44	4228311	0.9	9E-10
RN-M-44	4228432	0.9	9E-10
RN-M-45	4228446	0.9	9E-10
RN-M-45	4228449	0.8	8E-10
RN-M-46	4228411	0.4	4E-10
RN-M-46	4228461	0.7	7E-10
RN-M-47	4228352	0.7	7E-10
RN-M-47	4228398	0.8	8E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

*Table A-3. Radon Data for Monticello, Third Quarter 1997  
(date installed: 07/01/1997; date removed: 09/29/1997)*

Sample Location	Detector Number	Radon Concentration	
		----- (pCi/L)	( $\mu$ Ci/mL)
R-M-01-RN	4228202	0.4	4E-10
R-M-01-RN	4228298	0.8	8E-10
R-M-02-RN	4228327	0.5	5E-10
R-M-02-RN	4228365	0.5	5E-10
R-M-03-RN	4228338	0.6	6E-10
R-M-03-RN	4228416	0.7	7E-10
R-M-04-RN	4228264	<0.3	<3E-10
R-M-04-RN	4228305	<0.3	<3E-10
R-M-05-RN	4228343	<0.3	<3E-10
R-M-05-RN	4228389	0.4	4E-10
R-M-06-RN	4228224	0.4	4E-10
R-M-06-RN	4228413	<0.3	<3E-10
R-M-07-RN	4228372	0.4	4E-10
R-M-07-RN	4228422	0.4	4E-10
R-M-08-RN	4228270	0.5	5E-10
R-M-08-RN	4228414	<0.3	<3E-10
R-M-09-RN	4228271	0.3	3E-10
R-M-09-RN	4228320	<0.3	<3E-10
R-M-11-RN	4228302	1.1	1.1E-09
R-M-11-RN	4228373	0.7	7E-10
RN-M-04	4228339	0.7	7E-10
RN-M-04	4228427	0.7	7E-10
RN-M-06	4228293	0.6	6E-10
RN-M-07	4228304	1.5	1.5E-09
RN-M-07	4228351	1.8	1.8E-09
RN-M-08	4228330	0.4	4E-10
RN-M-09	4228218	0.8	8E-10
RN-M-09	4228319	0.9	9E-10
RN-M-10	4228231	0.7	7E-10
RN-M-10	4228258	0.8	8E-10
RN-M-11	4213245	<0.3	<3E-10
RN-M-11	4228317	<0.3	<3E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

Table A-3 (continued). Radon Data for Monticello, Third Quarter 1997  
(date installed: 07/01/1997; date removed: 09/29/1997)

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
RN-M-14	4228364	<0.3	<3E-10
RN-M-14	4228438	0.4	4E-10
RN-M-15	4228229	<0.3	<3E-10
RN-M-15	4228394	0.4	4E-10
RN-M-16	4228232	0.5	5E-10
RN-M-16	4228237	0.5	5E-10
RN-M-18	4228236	0.6	6E-10
RN-M-18	4228257	0.5	5E-10
RN-M-20	4213267	0.4	4E-10
RN-M-20	4228354	<0.3	<3E-10
RN-M-22	4228285	<0.3	<3E-10
RN-M-22	4228329	<0.3	<3E-10
RN-M-24	4228209	<0.3	<3E-10
RN-M-24	4228445	0.5	5E-10
RN-M-26	4228255	0.5	5E-10
RN-M-26	4228382	0.4	4E-10
RN-M-28	4228187	0.6	6E-10
RN-M-28	4338390	0.4	4E-10
RN-M-30	4228349	0.8	8E-10
RN-M-30	4228359	0.8	8E-10
RN-M-32	4228312	<0.3	<3E-10
RN-M-32	4228347	0.7	7E-10
RN-M-34	4228291	0.5	5E-10
RN-M-34	4228423	0.5	5E-10
RN-M-37	4228192	0.5	5E-10
RN-M-37	4228334	0.3	3E-10
RN-M-38	4228326	3.0	3.0E-09
RN-M-38	4228346	1.9	1.9E-09
RN-M-39	4228216	<0.3	<3E-10
RN-M-39	4228248	<0.3	<3E-10
RN-M-40	4228297	1.9	1.9E-09
RN-M-40	4228441	0.8	8E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

Table A-3 (continued). Radon Data for Monticello, Third Quarter 1997  
(date installed: 07/01/1997; date removed: 09/29/1997)

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
RN-M-41	4228197	0.6	6E-10
RN-M-41	4228281	0.6	6E-10
RN-M-42	4228321	<0.3	<3E-10
RN-M-42	4228348	0.4	4E-10
RN-M-43	4228325	0.8	8E-10
RN-M-43	4228358	0.4	4E-10
RN-M-44	4228221	1.0	1.0E-09
RN-M-44	4228362	0.9	9E-10
RN-M-45	4228222	0.7	7E-10
RN-M-45	4228228	0.7	7E-10
RN-M-46	4228309	<0.3	<3E-10
RN-M-46	4228341	0.5	5E-10
RN-M-47	4228208	0.7	7E-10
RN-M-47	4228335	0.8	8E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

*Table A-4. Radon Data for Monticello, Fourth Quarter 1997*  
*(date installed: 09/29/1997; date removed: 12/29/1997)*

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
R-M-1-RN	4258080	0.4	4E-10
R-M-1-RN	4258167	<0.3	<3E-10
R-M-2-RN	4258111	<0.3	<3E-10
R-M-2-RN	4258142	0.4	4E-10
R-M-3-RN	4258082	0.6	6E-10
R-M-3-RN	4258101	0.6	6E-10
R-M-4-RN	4258066	<0.3	<3E-10
R-M-4-RN	4258150	0.4	4E-10
R-M-5-RN	4258123	0.6	6E-10
R-M-5-RN	4258126	0.4	4E-10
R-M-6-RN	4251593	<0.3	<3E-10
R-M-6-RN	4258166	0.4	4E-10
R-M-7-RN	4251663	<0.3	<3E-10
R-M-7-RN	4251693	<0.3	<3E-10
R-M-8-RN	4258154	<0.3	<3E-10
R-M-8-RN	4258168	0.6	6E-10
R-M-9-RN	4251584	0.9	9E-10
R-M-9-RN	4258067	<0.3	<3E-10
R-M-11-RN	4258112	1.2	1.2E-09
R-M-11-RN	4258134	1.4	1.4E-09
RN-M-04	4251678	0.5	5E-10
RN-M-04	4258254	1.0	1.0E-09
RN-M-06	4258072	1.0	1.0E-09
RN-M-06	4258075	1.0	1.0E-09
RN-M-07	4221595	1.2	1.2E-09
RN-M-07	4258122	1.2	1.2E-09
RN-M-08	4258095	0.4	4E-10
RN-M-08	4258182	0.6	6E-10
RN-M-09	4258130	0.6	6E-10
RN-M-09	4258138	1.0	1.0E-09
RN-M-10	4251600	<0.3	<3E-10
RN-M-10	4251651	<0.3	<3E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = "x 10<sup>-10</sup>".

*Table A-4 (continued). Radon Data for Monticello, Fourth Quarter 1997  
(date installed: 09/29/1997; date removed: 12/29/1997)*

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
RN-M-11	4251695	<0.3	<3E-10
RN-M-11	4258177	0.5	5E-10
RN-M-14	4251611	<0.3	<3E-10
RN-M-14	4251641	<0.3	<3E-10
RN-M-15	4251596	0.5	5E-10
RN-M-15	4251657	0.4	4E-10
RN-M-16	4251535	0.5	5E-10
RN-M-16	4258203	0.4	4E-10
RN-M-18	4258114	0.4	4E-10
RN-M-18	4258183	0.5	5E-10
RN-M-20	4258084	0.5	5E-10
RN-M-20	4258099	0.5	5E-10
RN-M-22	4251624	1.8	1.8E-09
RN-M-22	4258225	1.7	1.7E-09
RN-M-24	4251639	0.5	5E-10
RN-M-24	4258175	0.6	6E-10
RN-M-26	4251676	0.6	6E-10
RN-M-26	4258081	0.4	4E-10
RN-M-28	4251616	0.5	5E-10
RN-M-28	4251689	0.6	6E-10
RN-M-30	4251594	0.4	4E-10
RN-M-30	4258108	0.8	8E-10
RN-M-32	4251640	0.7	7E-10
RN-M-32	4251687	0.7	7E-10
RN-M-34	4251653	0.4	4E-10
RN-M-34	4251681	0.4	4E-10
RN-M-37	4258092	0.8	8E-10
RN-M-37	4258098	0.5	5E-10
RN-M-38	4251610	<0.3	<3E-10
RN-M-38	4258091	<0.3	<3E-10
RN-M-39	4258151	0.5	5E-10
RN-M-39	4258185	<0.3	<3E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

*Table A-4 (continued). Radon Data for Monticello, Fourth Quarter 1997  
(date installed: 09/29/1997; date removed: 12/29/1997)*

Sample Location	Detector Number	Radon Concentration	
		(pCi/L)	( $\mu$ Ci/mL)
RN-M-40	4258076	0.5	5E-10
RN-M-40	4258105	0.6	6E-10
RN-M-41	4256146	0.5	5E-10
RN-M-41	4258128	<0.3	<3E-10
RN-M-42	4251609	0.6	6E-10
RN-M-42	4258137	0.5	5E-10
RN-M-43	4251625	0.4	4E-10
RN-M-43	4251660	0.6	6E-10
RN-M-44	4251591	1.0	1.0E-09
RN-M-44	4251645	1.0	1.0E-09
RN-M-45	4251666	0.9	9E-10
RN-M-45	4251698	0.5	5E-10
RN-M-46	4251553	0.7	7E-10
RN-M-46	4251662	0.9	9E-10
RN-M-47	4258064	0.7	7E-10
RN-M-47	4258139	0.5	5E-10

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

<sup>b</sup> Scientific notation E-10 = " $\times 10^{-10}$ ".

Table A-5. Suspended Particulates (PM<sub>10</sub>) Data at Station AIR-M-1 during 1997

Sample Date	Filter Number	Flow Rate (m <sup>3</sup> /min) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration (µg/m <sup>3</sup> )	Lead (µg/F) <sup>c</sup>	Lead (µg/m <sup>3</sup> )
04/21/1997	6560033	0.936	23.67	0.0236	18	~6.5	~0.29
04/27/1997	6560026	0.951	23.68	0.0087	6	~6.1	~0.27
05/03/1997	6560021	0.918	23.68	0.0181	14	~8.4	~0.39
05/09/1997	6560016	0.919	23.69	0.0103	8	~8.4	~0.39
05/15/1997	6560010	0.903	23.68	0.0260	20	~11.9	~0.56
05/21/1997	6560004	0.916	23.70	0.0099	8	~11.2	~0.52
05/27/1997	6562896	0.917	23.67	0.0098	8	~11.3	~0.52
06/02/1997	6562889	0.900	23.68	0.0159	12	~11.9	~0.56
06/08/1997	6562882	0.913	23.68	0.0067	5	~13.5	~0.62
06/14/1997	6562875	0.922	23.69	0.0410	31	~11.9	~0.54
06/20/1997	6562865	0.915	23.70	0.0234	18	~6.2	~0.29
06/26/1997	6562856	0.902	23.70	0.0445	35	~7.7	~0.36
07/02/1997	6562848	0.902	23.70	0.0373	29	~10.6	~0.50
07/08/1997	6562840	0.885	23.72	0.0389	31	~11.6	~0.55
07/14/1997	6562830	0.900	23.75	0.0245	19	~13.9	~0.65
07/20/1997	6562822	0.889	23.70	0.0191	15	~13.2	~0.63
07/26/1997	6562814	0.902	23.82	0.0189	15	~14.3	~0.67
08/01/1997	6562806	0.889	23.57	0.0218	17	~9.9	~0.47
08/07/1997	6671696	0.891	23.82	0.0098	8	~11.1	~0.52
08/13/1997	6671688	0.893	23.72	0.0175	14	~11.7	~0.55
08/19/1997	6671680	0.891	23.70	0.0193	15	~13.5	~0.64
08/25/1997	6671672	0.904	23.70	0.0157	12	~12.0	~0.56
08/31/1997	6671664	0.892	23.72	0.0089	7	~11.5	~0.54
09/06/1997	6671656	0.909	23.70	0.0097	8	~10.5	~0.49
09/12/1997	6671648	0.923	23.72	0.0119	9	~7.8	~0.36
09/18/1997	6671640	0.923	23.73	0.0091	7	~11.7	~0.53
09/24/1997	6671632	0.915	23.73	0.0073	6	~11.8	~0.54
09/30/1997	6671624	0.911	23.75	0.0147	11	~15.4	~0.71

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-5 (continued). Suspended Particulates ( $PM_{10}$ ) Data at Station AIR-M-1 during 1997

Sample Date	Filter Number	Flow Rate ( $m^3/min$ ) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration ( $\mu g/m^3$ )	Lead ( $\mu g/F$ ) <sup>c</sup>	Lead ( $\mu g/m^3$ )
10/06/1997	6671616	0.892	23.73	0.0122	10	-11.1	-0.52
10/12/1997	6671608	0.914	23.73	0.0033	3	-12.5	-0.58
10/18/1997	6668400	0.870	23.72	0.0156	13	-11.8	-0.57
10/24/1997	6668392	0.944	23.92	0.0091	7	-12.5	-0.55
10/30/1997	6668384	0.923	23.75	0.0116	9	-11.2	-0.51
11/05/1997	6668376	0.923	23.73	0.0156	12	-11.9	-0.54
11/11/1997	6668368	0.926	23.75	0.0026	2	11.9	0.54
11/17/1997	6668360	0.956	23.73	0.0051	4	15.0	0.66
11/29/1997	6668344	0.995	23.72	0.0007	<1	11.7	0.50
12/05/1997	6668336	0.970	23.98	0.0056	4	13.0	0.56
12/11/1997	6668326	0.984	23.75	0.0065	5	12.4	0.53
12/17/1997	6668318	0.969	23.75	0.0076	6	11.4	0.50
12/23/1997	6668310	0.951	23.75	0.0067	5	10.6	0.47
12/29/1997	6668302	0.953	23.75	0.0013	1	11.5	0.51

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-6. Suspended Particulates ( $PM_{10}$ ) Data at Station AIR-M-3 during 1997

Sample Date	Filter Number	Flow Rate ( $m^3/min$ ) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration ( $\mu g/m^3$ )	Lead ( $\mu g/F$ ) <sup>c</sup>	Lead ( $\mu g/m^3$ )
04/21/1997	6560032	0.927	23.97	0.0202	15	~11.8	~0.53
04/27/1997	6560025	0.927	23.96	0.0095	7	~6.2	~0.28
05/03/1997	6560020	0.925	23.96	0.0172	13	~10.2	~0.46
05/09/1997	6560015	0.926	23.97	0.0162	12	~3.6	~0.16
05/21/1997	6560003	0.908	23.97	0.0132	10	~12.1	~0.56
05/27/1997	6562895	0.924	23.96	0.0109	8	~12.0	~0.54
06/02/1997	6562888	0.938	23.94	0.0234	17	~12.7	~0.57
06/08/1997	6562881	0.921	23.95	0.0063	5	~11.0	~0.50
06/14/1997	6562874	0.945	23.95	0.0496	37	~13.4	~0.59
06/20/1997	6562864	0.923	23.91	0.0274	21	~6.5	~0.29
06/26/1997	6562855	0.866	23.97	0.0486	39	~6.6	~0.32
07/02/1997	6562847	0.881	23.97	0.0736	58	~11.0	~0.52
07/08/1997	6562839	0.909	23.96	0.0386	30	~10.3	~0.47
07/14/1997	6562829	0.889	24.07	0.0287	22	~14.0	~0.65
07/20/1997	6562821	0.878	23.97	0.0144	11	~11.5	~0.55
07/26/1997	6562813	0.907	24.03	0.0204	16	~13.4	~0.62
08/01/1997	6562805	0.909	23.94	0.0180	14	~11.4	~0.52
08/07/1997	6671695	0.895	23.94	0.0129	10	~11.2	~0.52
08/13/1997	6671687	0.913	23.94	0.0212	16	~11.7	~0.54
08/19/1997	6671679	0.910	23.95	0.0248	19	~13.3	~0.61
08/25/1997	6671671	0.893	23.94	0.0226	18	~10.6	~0.50
08/31/1997	6671663	0.896	23.96	0.0157	12	~7.4	~0.34
09/06/1997	6671655	0.897	23.95	0.0109	8	~8.1	~0.38
09/12/1997	6671647	0.880	23.96	0.0190	15	~7.5	~0.36
09/18/1997	6671639	0.880	23.96	0.0149	12	~9.3	~0.44
09/24/1997	6671631	0.902	23.97	0.0095	7	~11.1	~0.51
09/30/1997	6671623	0.882	23.96	0.0140	11	~14.8	~0.70

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-6 (continued). Suspended Particulates ( $PM_{10}$ ) Data at Station AIR-M-3 during 1997

Sample Date	Filter Number	Flow Rate ( $m^3/min$ ) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration ( $\mu g/m^3$ )	Lead ( $\mu g/F$ ) <sup>c</sup>	Lead ( $\mu g/m^3$ )
10/06/1997	6671615	0.880	23.69	0.0169	14	-13.2	-0.63
10/12/1997	6671607	0.785	23.97	0.0036	3	-12.7	-0.67
10/18/1997	6668399	0.888	23.99	0.0143	11	-12.3	-0.58
10/24/1997	6668391	0.881	24.13	0.0130	10	-12.1	-0.57
10/30/1997	6668383	0.892	23.99	0.0150	12	-11.1	-0.52
11/05/1997	6668375	0.909	23.99	0.0199	15	-13.0	-0.60
11/11/1997	6668367	0.895	23.97	0.0039	3	13.0	0.61
11/17/1997	6668359	0.906	23.96	0.0168	13	14.8	0.68
11/23/1997	6668351	0.918	23.96	0.0108	8	12.8	0.58
11/29/1997	6668343	0.932	23.97	0.0031	2	12.3	0.55
12/05/1997	6668335	0.954	24.01	0.0075	5	13.5	0.59
12/11/1997	6668325	0.915	23.94	0.0084	6	12.3	0.56
12/17/1997	6668317	0.953	23.94	0.0198	14	12.2	0.53
12/23/1997	6668309	0.984	23.96	0.0133	9	10.7	0.45
12/29/1997	6668301	0.986	23.95	0.0051	4	12.0	0.51

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-7. Suspended Particulates (PM<sub>10</sub>) Data at Station AIR-M-5 during 1997

Sample Date	Filter Number	Flow Rate (m <sup>3</sup> /min) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration (µg/m <sup>3</sup> )	Lead (µg/F) <sup>c</sup>	Lead (µg/m <sup>3</sup> )
05/21/1997	6560002	0.940	24.37	0.0122	9	~11.5	~0.50
05/27/1997	6562894	0.941	23.92	0.0144	11	~11.7	~0.52
06/02/1997	6562887	0.989	23.86	0.0300	21	~11.1	~0.47
06/08/1997	6562880	0.921	23.83	0.0122	9	~8.7	~0.40
06/14/1997	6562873	0.914	23.84	0.0390	30	~11.8	~0.54
06/20/1997	6562862	0.924	23.84	0.0178	13	~6.1	~0.28
07/02/1997	6562846	0.926	23.85	0.0456	34	~12.2	~0.55
07/14/1997	6562828	0.872	24.12	0.0323	26	~13.4	~0.64
07/20/1997	6562820	0.893	24.12	0.0140	11	~12.6	~0.59
07/26/1997	6562812	0.843	24.16	0.0252	21	~14.3	~0.70
08/01/1997	6562804	0.892	24.16	0.0144	11	~9.8	~0.45
08/07/1997	6671694	0.894	24.05	0.0149	12	~11.5	~0.53
08/13/1997	6671686	0.896	24.10	0.0211	16	~11.9	~0.55
08/19/1997	6671678	0.894	24.07	0.0178	14	~13.2	~0.61
08/25/1997	6671670	0.877	24.08	0.0129	10	~12.3	~0.58
08/31/1997	6671662	0.880	24.08	0.0108	8	~11.4	~0.54
09/06/1997	6671654	0.882	24.06	0.0142	11	~11.7	~0.55
09/12/1997	6671646	0.880	24.10	0.0122	10	~7.6	~0.36
09/24/1997	6671625	0.872	24.09	0.0078	6	~13.0	~0.62
09/30/1997	6671622	0.867	24.10	0.0103	8	~15.3	~0.73
10/06/1997	6671614	0.895	24.10	0.0091	7	~12.9	~0.60
10/12/1997	6671606	0.918	24.09	0.0075	6	~12.6	~0.57
10/18/1997	6668398	0.905	24.17	0.0136	10	~12.7	~0.58
10/24/1997	6668390	0.917	24.09	0.0125	9	~17.5	~0.79
10/30/1997	6668382	0.895	24.13	0.0244	19	~12.1	~0.56

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-7 (continued). Suspended Particulates ( $PM_{10}$ ) Data at Station AIR-M-5 during 1997

Sample Date	Filter Number	Flow Rate ( $m^3/min$ ) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration ( $\mu g/m^3$ )	Lead ( $\mu g/F$ ) <sup>c</sup>	Lead ( $\mu g/m^3$ )
11/05/1997	6668374	0.895	24.11	0.0428	33	-13.9	-0.64
11/11/1997	6668366	0.914	24.10	0.0054	4	14.3	0.65
11/17/1997	6668358	0.929	24.11	0.0190	14	13.2	0.59
11/23/1997	6668350	0.938	24.11	0.0143	11	10.9	0.48
11/29/1997	6668342	0.935	25.10	0.0058	4	12.3	0.52
12/05/1997	6668334	0.958	23.94	0.0082	6	13.8	0.60
12/11/1997	6668324	0.956	24.40	0.0085	6	12.2	0.52
12/17/1997	6668316	0.941	24.10	0.0209	15	12.6	0.56
12/23/1997	6668308	0.971	24.10	0.0200	14	13.1	0.56
12/29/1997	6742100	0.941	24.10	0.0103	8	12.3	0.54

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-8. Suspended Particulates (PM<sub>10</sub>) Data at Station AIR-M-6 during 1997

Sample Date	Filter Number	Flow Rate (m <sup>3</sup> /min) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration (µg/m <sup>3</sup> )	Lead (µg/F) <sup>c</sup>	Lead (µg/m <sup>3</sup> )
04/21/1997	6560030	0.961	23.84	0.0178	13	~7.7	~0.34
04/27/1997	6560024	0.975	24.14	0.0080	6	~4.5	~0.19
05/03/1997	6560019	0.959	24.16	0.0138	10	~7.4	~0.32
05/09/1997	6560014	0.946	24.15	0.0118	9	~7.6	~0.33
05/15/1997	6560008	0.928	24.14	0.0165	12	~13.7	~0.61
05/21/1997	6560001	0.942	24.13	0.0050	4	~13.4	~0.59
05/27/1997	6562893	0.944	24.23	0.0074	5	~12.0	~0.52
06/02/1997	6562886	0.951	23.63	0.0124	9	~11.4	~0.51
06/08/1997	6562879	0.939	23.65	0.0069	5	~10.2	~0.46
06/14/1997	6562872	0.917	23.65	0.0338	26	~10.9	~0.50
06/20/1997	6562861	0.896	23.64	0.0134	11	~5.9	~0.28
06/26/1997	6562853	0.899	23.64	0.0208	16	~10.2	~0.48
07/02/1997	6562845	0.899	23.66	0.0209	16	~10.9	~0.51
07/08/1997	6562837	0.883	23.65	0.0223	18	~10.6	~0.51
07/14/1997	6562827	0.914	23.72	0.0140	11	~13.6	~0.63
07/20/1997	6562819	0.891	23.65	0.0106	8	~12.6	~0.60
07/26/1997	6562811	0.902	23.73	0.0121	9	~13.7	~0.64
08/01/1997	6562803	0.890	23.64	0.0111	9	~11.5	~0.55
08/07/1997	6671693	0.906	23.64	0.0114	9	~11.9	~0.56
08/13/1997	6671685	0.895	23.75	0.0149	12	~11.7	~0.55
08/19/1997	6671677	0.892	23.54	0.0153	12	~12.8	~0.61
08/25/1997	6671669	0.890	23.64	0.0121	10	~10.8	~0.51
08/31/1997	6671661	0.908	23.65	0.0089	7	~9.5	~0.44
09/06/1997	6671653	0.895	23.64	0.0087	7	~11.1	~0.52
09/12/1997	6671645	0.893	23.66	0.0098	8	~9.1	~0.43
09/18/1997	6671637	0.893	23.64	0.0093	7	~10.5	~0.50
09/24/1997	6671630	0.901	23.65	0.0062	5	~10.3	~0.48
09/30/1997	6671621	0.911	23.65	0.0067	5	~14.3	~0.66

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-8 (continued). Suspended Particulates (PM<sub>10</sub>) Data at Station AIR-M-6 during 1997

Sample Date	Filter Number	Flow Rate (m <sup>3</sup> /min) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration (µg/m <sup>3</sup> )	Lead (µg/F) <sup>c</sup>	Lead (µg/m <sup>3</sup> )
10/06/1997	6671613	0.893	23.64	0.0076	6	~14.4	~0.68
10/12/1997	6671605	0.918	23.65	0.0045	3	~12.0	~0.55
10/18/1997	6668397	0.904	23.70	0.0124	10	~13.4	~0.63
10/24/1997	6668389	0.960	23.70	0.0129	9	~12.7	~0.56
10/30/1997	6668381	0.969	23.65	0.0051	4	~12.8	~0.56
11/05/1997	6668373	0.954	23.64	0.0070	5	~11.6	~0.51
11/11/1997	6668365	0.957	23.64	0.0035	3	9.8	0.43
11/17/1997	6668357	0.943	23.65	0.0035	3	12.4	0.56
11/23/1997	6668349	0.952	23.60	0.0056	4	12.3	0.55
11/29/1997	6668341	0.963	23.64	0.0020	1	12.1	0.53
12/05/1997	6668333	0.986	23.75	0.0079	6	13.7	0.59
12/11/1997	6668323	0.986	23.63	0.0048	3	12.4	0.53
12/17/1997	6668315	0.985	23.63	0.0087	6	10.2	0.44
12/23/1997	6668307	0.967	23.64	0.0086	6	13.6	0.59

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-9. Suspended Particulates ( $PM_{10}$ ) Data at Station AIR-M-7 during 1997

Sample Date	Filter Number	Flow Rate ( $m^3/min$ ) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration ( $\mu g/m^3$ )	Lead ( $\mu g/F$ ) <sup>c</sup>	Lead ( $\mu g/m^3$ )
04/21/1997	6560029	0.960	24.24	0.0154	11	<3.3	<0.14
04/27/1997	6560023	0.946	23.99	0.0061	4	<3.3	<0.15
05/03/1997	6560018	0.945	24.05	0.0116	9	-10.0	-0.44
05/09/1997	6560012	0.946	24.06	0.0111	8	-4.9	-0.22
05/15/1997	6560007	0.914	24.07	0.0173	13	-12.6	-0.57
05/21/1997	6562899	0.929	24.05	0.0108	8	-10.2	-0.46
05/27/1997	6562892	0.916	24.08	0.0070	5	-10.9	-0.49
06/02/1997	6562885	0.911	24.06	0.0140	11	-10.7	-0.49
06/08/1997	6562878	0.899	24.07	0.0063	5	-10.5	-0.49
06/14/1997	6562871	0.905	24.03	0.0379	29	-13.3	-0.61
06/20/1997	6562860	0.910	24.05	0.0125	10	-6.4	-0.29
06/26/1997	6562852	0.900	24.05	0.0189	15	-12.4	-0.57
07/02/1997	6562844	0.886	24.03	0.0140	11	-10.5	-0.49
07/08/1997	6562836	0.884	24.06	0.0343	27	-10.6	-0.50
07/14/1997	6562826	0.884	24.07	0.0160	13	-13.7	-0.64
07/20/1997	6562818	0.903	24.07	0.0113	9	-12.8	-0.59
07/26/1997	6562810	0.886	24.03	0.0110	9	-13.9	-0.65
08/01/1997	6562802	0.889	24.04	0.0080	6	-10.9	-0.51
08/07/1997	6671692	0.891	24.05	0.0123	10	-11.6	-0.54
08/13/1997	6671684	0.894	24.04	0.0138	11	-11.8	-0.55
08/19/1997	6671676	0.891	24.04	0.0116	9	-11.8	-0.55
08/25/1997	6671668	0.902	24.05	0.0157	12	-11.5	-0.53
08/31/1997	6671660	0.906	24.04	0.0089	7	-9.5	-0.44
09/06/1997	6671652	0.908	24.03	0.0055	4	-8.2	-0.38
09/12/1997	6671644	0.892	24.02	0.0147	11	-12.3	-0.57
09/18/1997	6671636	0.866	24.03	0.0065	5	-11.2	-0.54
09/24/1997	6671629	0.873	24.05	0.0037	3	-10.6	-0.50
09/30/1997	6671620	0.882	24.06	0.0096	8	-13.2	-0.62

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-9 (continued). Suspended Particulates (PM<sub>10</sub>) Data at Station AIR-M-7 during 1997

Sample Date	Filter Number	Flow Rate (m <sup>3</sup> /min) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration (μg/m <sup>3</sup> )	Lead (μg/F) <sup>c</sup>	Lead (μg/m <sup>3</sup> )
10/06/1997	6671612	0.893	24.07	0.0055	4	~11.4	~0.53
10/12/1997	6671604	0.917	24.07	0.0053	4	~11.6	~0.53
10/18/1997	6668396	0.903	24.06	0.0091	7	~10.5	~0.48
10/24/1997	6668388	0.929	24.09	0.0019	1	~12.8	~0.57
10/30/1997	6668380	0.936	24.12	0.0033	2	~12.1	~0.54
11/05/1997	6668372	0.937	24.07	0.0034	3	~10.4	~0.46
11/11/1997	6668364	0.939	24.08	0.0016	1	12.3	0.54
11/17/1997	6668356	0.942	24.09	0.0024	2	12.5	0.55
11/23/1997	6668348	0.935	28.07	0.0044	3	12.0	0.46
11/29/1997	6668340	0.931	20.06	0.0003	<1	12.2	0.65
12/05/1997	6668332	0.967	24.22	0.0047	3	13.2	0.56
12/11/1997	6668322	0.982	24.07	0.0034	2	11.5	0.49
12/17/1997	6668314	0.952	26.07	0.0026	2	12.2	0.49
12/23/1997	6668306	0.963	22.08	0.0052	4	10.6	0.50
12/29/1997	6742098	0.966	24.05	0.0024	2	12.3	0.53

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-10. Suspended Particulates ( $PM_{10}$ ) Data at Station AIR-M-8 during 1997

Sample Date	Filter Number	Flow Rate ( $m^3/min$ ) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration ( $\mu g/m^3$ )	Lead ( $\mu g/F$ ) <sup>c</sup>	Lead ( $\mu g/m^3$ )
05/09/1997	6560013	0.926	23.67	0.0143	11	~9.5	~0.43
05/15/1997	6560006	0.923	23.60	0.0430	33	~13.2	~0.61
05/21/1997	6562898	0.923	23.72	0.0078	6	~11.2	~0.51
05/27/1997	6562891	0.939	23.65	0.0101	8	~10.9	~0.49
06/02/1997	6562884	0.905	24.17	0.0132	10	~11.2	~0.51
06/08/1997	6562877	0.920	24.18	0.0082	6	~9.8	~0.44
06/14/1997	6562870	0.898	24.17	0.0375	29	~11.5	~0.53
06/20/1997	6562859	0.890	24.19	0.0125	10	~5.9	~0.27
06/26/1997	6562851	0.893	24.20	0.0347	27	~5.8	~0.27
07/02/1997	6562843	0.879	24.07	0.0229	18	~10.9	~0.52
07/08/1997	6562835	0.877	24.17	0.0377	30	~10.8	~0.51
07/14/1997	6562825	0.915	24.29	0.0476	36	~14.4	~0.65
07/20/1997	6562817	0.906	24.28	0.0200	15	~12.9	~0.59
07/26/1997	6562809	0.903	24.24	0.0136	10	~13.1	~0.60
08/01/1997	6562801	0.906	24.20	0.0138	10	~11.8	~0.54
08/07/1997	6671691	0.922	24.24	0.0073	5	~11.4	~0.51
08/13/1997	6671683	0.925	24.23	0.0198	15	~12.3	~0.55
08/19/1997	6671675	0.908	24.18	0.0189	14	~12.1	~0.55
08/25/1997	6671667	0.906	24.20	0.0113	9	~12.4	~0.57
08/31/1997	6671659	0.910	24.20	0.0106	8	~12.9	~0.59
09/06/1997	6671651	0.926	24.20	0.0080	6	~9.4	~0.42
09/12/1997	6671643	0.923	24.24	0.0094	7	~13.2	~0.59
09/18/1997	6671635	0.909	24.22	0.0100	8	~9.9	~0.45
09/24/1997	6671628	0.917	24.22	0.0069	5	~13.2	~0.59
09/30/1997	6671619	0.898	29.22	0.0058	4	~14.0	~0.53
10/06/1997	6671611	0.895	24.26	0.0087	7	~9.0	~0.41
10/12/1997	6671603	0.906	24.28	0.0064	5	~12.9	~0.59

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-10 (continued). Suspended Particulates (PM<sub>10</sub>) Data at Station AIR-M-8 during 1997

Sample Date	Filter Number	Flow Rate (m <sup>3</sup> /min) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration (µg/m <sup>3</sup> )	Lead (µg/F) <sup>c</sup>	Lead (µg/m <sup>3</sup> )
10/18/1997	6668395	0.920	24.27	0.0118	9	~13.3	~0.60
10/24/1997	6668387	0.962	24.42	0.0154	11	~11.7	~0.50
10/30/1997	6668379	0.926	24.25	0.1170	87	~13.8	~0.61
11/05/1997	6668371	0.927	24.25	0.1463	109	~12.7	~0.57
11/11/1997	6668363	0.944	24.24	0.0016	1	11.6	0.51
11/17/1997	6668355	0.902	24.26	0.0042	3	12.4	0.57
11/23/1997	6668347	0.925	24.26	0.0032	2	12.4	0.55
11/29/1997	6668339	0.935	24.25	0.0007	1	11.0	0.48
12/05/1997	6668331	0.958	24.43	0.0042	3	13.6	0.58
12/11/1997	6668321	0.959	24.28	0.0022	2	11.5	0.49
12/17/1997	6668313	0.957	24.24	0.0040	3	11.9	0.51
12/23/1997	6668305	0.998	24.28	0.0046	3	11.2	0.46
12/29/1997	6742097	1.001	24.25	0.0033	2	12.6	0.52

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-11. Suspended Particulates ( $PM_{10}$ ) Data at Station AIR-M-8A during 1997

Sample Date	Filter Number	Flow Rate ( $m^3/min$ ) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration ( $\mu g/m^3$ )	Lead ( $\mu g/F$ ) <sup>c</sup>	Lead ( $\mu g/m^3$ )
06/20/1997	6562857	0.933	23.97	0.0132	10	~5.5	~0.25
06/26/1997	6562850	0.915	23.97	0.0343	26	~7.2	~0.33
07/02/1997	6562842	0.915	23.97	0.0272	21	~11.7	~0.53
07/08/1997	6562834	0.994	23.98	0.0429	30	~11.8	~0.49
07/14/1997	6562824	0.897	24.11	0.0586	45	~15.3	~0.71
07/20/1997	6562816	0.902	24.04	0.0177	14	~12.7	~0.59
07/26/1997	6562808	0.899	24.01	0.0138	11	~14.0	~0.65
08/01/1997	6671700	0.902	23.93	0.0146	11	~11.5	~0.53
08/07/1997	6671690	0.904	24.02	0.0187	14	~11.5	~0.53
08/13/1997	6671682	0.925	24.04	0.0237	18	~12.3	~0.55
08/19/1997	6671674	0.960	23.96	0.0216	16	~10.7	~0.47
08/25/1997	6671666	0.940	23.94	0.0144	11	~11.6	~0.52
08/31/1997	6671658	0.981	23.96	0.0125	9	~10.3	~0.44
09/06/1997	6671650	0.954	24.03	0.0082	6	~8.1	~0.35
09/12/1997	6671642	0.952	23.95	0.0107	8	~9.6	~0.42
09/18/1997	6671634	0.930	23.94	0.0101	8	~7.7	~0.35
09/24/1997	6671627	0.914	24.04	0.0125	9	~13.5	~0.61
09/30/1997	6671618	0.955	23.96	0.0104	8	~14.8	~0.65
10/06/1997	6671610	0.931	23.97	0.0086	6	~10.8	~0.48
10/12/1997	6671602	0.971	23.98	0.0051	4	~13.5	~0.58
10/18/1997	6668394	0.983	24.00	0.0142	10	~10.4	~0.44
10/24/1997	6668386	1.017	24.18	0.0089	6	~12.3	~0.50
10/30/1997	6668378	0.989	24.03	0.1440	101	~14.5	~0.61
11/05/1997	6668370	0.965	24.03	0.1441	104	~14.6	~0.63
11/11/1997	6668362	0.944	23.99	0.0035	3	11.3	0.50
11/17/1997	6668354	0.955	23.99	0.0052	4	11.1	0.48
11/23/1997	6668346	0.950	23.99	0.0052	4	12.4	0.54
11/29/1997	6668338	0.948	23.98	0.0020	1	11.6	0.51

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-11 (continued). Suspended Particulates ( $PM_{10}$ ) Data at Station AIR-M-8A during 1997

Sample Date	Filter Number	Flow Rate ( $m^3/min$ ) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concen- tration ( $\mu g/m^3$ )	Lead ( $\mu g/F$ ) <sup>c</sup>	Lead ( $\mu g/m^3$ )
12/05/1997	6668330	1.001	24.16	0.0039	3	13.5	0.56
12/11/1997	6668320	1.011	23.98	0.0052	4	12.3	0.51
12/17/1997	6668312	0.976	24.04	0.0036	3	11.2	0.48
12/23/1997	6668304	0.975	24.00	0.0055	4	10.0	0.43
12/29/1997	6742096	0.976	24.00	0.0052	4	11.4	0.49

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-12. Suspended Particulates (PM<sub>10</sub>) Data at Station AIR-M-9 during 1997

Sample Date	Filter Number	Flow Rate (m <sup>3</sup> /min) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration (µg/m <sup>3</sup> )	Lead (µg/F) <sup>c</sup>	Lead (µg/m <sup>3</sup> )
04/21/1997	6560027	0.916	24.00	0.0120	9	~7.6	~0.35
04/27/1997	6560022	0.916	24.02	0.0072	5	<3.3	<0.15
05/21/1997	6562897	0.930	24.02	0.0075	6	~10.9	~0.49
05/27/1997	6562890	0.932	24.00	0.0075	6	~12.4	~0.55
06/02/1997	6562883	0.927	23.98	0.0145	11	~10.9	~0.49
06/08/1997	6562876	0.928	24.00	0.0042	3	~12.1	~0.54
06/14/1997	6562868	0.935	23.99	0.0377	28	~13.2	~0.59
06/20/1997	6562858	0.898	23.98	0.0112	9	~6.2	~0.29
06/26/1997	6562849	0.915	24.00	0.0383	29	~7.0	~0.32
07/02/1997	6562841	0.900	24.02	0.0398	31	~11.1	~0.51
07/08/1997	6562833	0.869	23.98	0.0227	18	~10.6	~0.51
07/14/1997	6562823	0.898	24.08	0.0161	12	~12.4	~0.57
07/20/1997	6562815	0.889	23.98	0.0119	9	~12.5	~0.59
07/26/1997	6562807	0.900	24.07	0.0105	8	~13.9	~0.64
08/01/1997	6671699	0.889	23.98	0.0097	8	~11.6	~0.54
08/07/1997	6671689	0.905	23.98	0.0160	12	~11.3	~0.52
08/13/1997	6671681	0.917	24.43	0.0182	14	~12.0	~0.54
08/19/1997	6671673	0.905	23.97	0.0183	14	~11.0	~0.51
08/25/1997	6671665	0.903	23.98	0.0148	11	~10.8	~0.50
08/31/1997	6671657	0.907	23.98	0.0134	10	~10.7	~0.49
09/06/1997	6671649	0.909	24.00	0.0096	7	~7.7	~0.35
09/12/1997	6671641	0.921	24.02	0.0133	10	~10.1	~0.46
09/18/1997	6671633	0.906	24.00	0.0044	3	~9.4	~0.43
09/24/1997	6671626	0.914	24.00	0.0041	3	~13.1	~0.60
09/30/1997	6671617	0.910	24.00	0.0047	4	~14.2	~0.65

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-12 (continued). Suspended Particulates ( $PM_{10}$ ) Data at Station AIR-M-9 during 1997

Sample Date	Filter Number	Flow Rate ( $m^3/min$ ) <sup>a</sup>	Sample Time (hours)	Weight (g/F) <sup>b</sup>	Concentration ( $\mu g/m^3$ )	Lead ( $\mu g/F$ ) <sup>c</sup>	Lead ( $\mu g/m^3$ )
10/06/1997	6671609	0.907	24.00	0.0033	3	~10.8	~0.50
10/12/1997	6671601	0.901	24.00	0.0025	2	~12.5	~0.58
10/18/1997	6668393	0.917	24.02	0.0075	6	~10.6	~0.48
10/24/1997	6668385	0.929	24.13	0.0038	3	~11.5	~0.51
10/30/1997	6668377	0.923	24.00	0.0004	<1	~11.9	~0.54
11/05/1997	6668369	0.923	24.02	0.0059	4	~11.5	~0.52
11/11/1997	6668361	0.941	24.00	0.0016	1	12.3	0.54
11/17/1997	6668353	0.957	24.02	0.0006	<1	12.6	0.55
11/23/1997	6668345	0.860	24.00	0.0021	2	11.4	0.55
12/05/1997	6668329	0.954	24.22	0.0039	3	12.2	0.53
12/11/1997	6668319	0.939	24.02	0.0020	1	11.5	0.51
12/17/1997	6668311	0.939	24.02	0.0006	<1	12.1	0.54
12/23/1997	6668303	0.982	24.02	0.0021	1	12.9	0.55
12/29/1997	6742095	0.969	24.02	0.0035	3	12.8	0.55

<sup>a</sup> Volumetric values of flow have been corrected to EPA standard temperature and pressure.

<sup>b</sup> Grams per filter.

<sup>c</sup> Micrograms per filter.

Table A-13. Radioparticulate Air Sample Results for 1997

Sample Location	Sample Date	Flow Rate (L/h) <sup>b</sup>	Sample Time (hours)	Radium-226		Thorium-230			Uranium		Polonium-210	
				(pCi/F) <sup>c</sup>	( $\mu$ Ci/mL)	(pCi/F)	( $\mu$ Ci/mL)	(pg/mL) <sup>d</sup>	( $\mu$ g/F) <sup>e</sup>	( $\mu$ g/m <sup>3</sup> )	( $\mu$ Ci/mL) <sup>f</sup>	(pCi/F) ( $\mu$ Ci/mL)
R-M-1-AIR	04/1997	3600	244.0	<0.11	<1.3E-16	<0.11	<1.3E-16	<6.7E-09	<0.40	<4.6E-04	<3.2E-16	1.16 1.3E-15
R-M-1-AIR	05/1997	3600	877.0	0.92	2.9E-16	0.21	6.7E-17	3.5E-09	-1.1	-3.5E-04	-2.4E-16	11.81 3.7E-15
R-M-1-AIR	06/1997	3600	555.0	1.81	9.1E-16	1.35	6.8E-16	3.5E-08	-1.3	-6.5E-04	-4.5E-16	6.58 3.3E-15
R-M-1-AIR	07/1997	3600	552.0	2.02	1.0E-15	1.81	9.1E-16	4.7E-08	-2.0	-1.0E-03	-6.9E-16	5.76 2.9E-15
R-M-1-AIR	08/1997	3600	568.0	1.24	6.1E-16	1.31	6.4E-16	3.3E-08	-1.4	-6.8E-04	-4.7E-16	7.66 3.7E-15
R-M-1-AIR	09/1997	3600	512.0	1.08	5.9E-16	0.67	3.6E-16	1.9E-08	-1.0	-5.4E-04	-3.7E-16	6.22 3.4E-15
R-M-1-AIR	10/1997	3600	508.0	1.14	6.2E-16	1.19	6.5E-16	3.4E-08	-1.5	-8.2E-04	-5.6E-16	9.99 5.5E-15
R-M-1-AIR	11/1997	3600	815.0	0.87	3.0E-16	1.04	3.5E-16	1.8E-08	1.5	5.1E-04	3.5E-16	16.27 5.5E-15
R-M-1-AIR	12/1997	3600	650.0	0.22	9.4E-17	0.35	1.5E-16	7.7E-09	-0.78	-3.3E-04	-2.3E-16	8.64 3.7E-15
R-M-2-AIR	04/1997	3600	292.0	0.35	3.3E-16	0.08	7.6E-17	3.9E-09	<0.40	<3.8E-04	<2.6E-16	1.51 1.4E-15
R-M-2-AIR	05/1997	3600	887.0	0.53	1.7E-16	0.14	4.4E-17	2.3E-09	-1.5	-4.7E-04	-3.2E-16	10.84 3.4E-15
R-M-2-AIR	06/1997	3600	600.0	1.68	7.8E-16	1.60	7.4E-16	3.8E-08	-1.6	-7.4E-04	-5.1E-16	7.19 3.3E-15
R-M-2-AIR	07/1997	3600	805.0	2.19	7.6E-16	2.01	6.9E-16	3.6E-08	-2.5	-8.6E-04	-5.9E-16	7.95 2.7E-15
R-M-2-AIR	08/1997	3600	465.0	1.31	7.8E-16	1.14	6.8E-16	3.5E-08	-1.2	-7.2E-04	-4.9E-16	6.34 3.8E-15
R-M-2-AIR	09/1997	3600	597.0	0.73	3.4E-16	0.65	3.0E-16	1.5E-08	-1.0	-4.7E-04	-3.2E-16	5.74 2.7E-15
R-M-2-AIR	10/1997	3600	697.0	1.09	4.3E-16	1.02	4.1E-16	2.1E-08	-1.6	-6.4E-04	-4.4E-16	10.31 4.1E-15
R-M-2-AIR	11/1997	3600	821.0	0.89	3.0E-16	0.71	2.4E-16	1.2E-08	1.4	4.7E-04	3.2E-16	12.88 4.4E-15
R-M-2-AIR	12/1997	3600	650.0	<0.25	<1.1E-16	0.33	1.4E-16	7.2E-09	-0.85	-3.6E-04	-2.5E-16	4.06 1.7E-15

<sup>a</sup> A "-" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

<sup>b</sup> L/h = liters per hour.

<sup>c</sup> pCi/F = picocuries per filter.

<sup>d</sup> pg/mL = picograms per milliliter. The conversion of thorium-230 concentrations between microcuries and picograms assumed equilibrium and an activity of 0.0194  $\mu$ Ci/ $\mu$ g.

<sup>e</sup>  $\mu$ g/F = micrograms per filter.

<sup>f</sup> The conversion of uranium concentrations between microcuries per milliliter and micrograms per cubic meter assumed equilibrium and an activity of 0.687 pCi/ $\mu$ g.

Table A-13 (continued). Radioparticulate Air Sample Results for 1997

Sample Location	Sample Date	Flow Rate (L/h) <sup>b</sup>	Sample Time (hours)	Radium-226		Thorium-230			Uranium			Polonium-210	
				(pCi/F) <sup>c</sup>	( $\mu$ Ci/mL)	(pCi/F)	( $\mu$ Ci/mL)	(pg/mL) <sup>d</sup>	( $\mu$ g/F) <sup>e</sup>	( $\mu$ g/m3)	( $\mu$ Ci/mL) <sup>f</sup>	(pCi/F)	( $\mu$ Ci/mL)
R-M-3-AIR	04/1997	3600	293.0	0.32	3.0E-16	<0.10	<9.5E-17	<4.9E-09	~0.41	~3.9E-04	~2.7E-16	1.85	1.8E-15
R-M-3-AIR	05/1997	3600	887.0	0.55	1.7E-16	0.21	6.6E-17	3.4E-09	~1.2	~3.8E-04	~2.6E-16	11.63	3.6E-15
R-M-3-AIR	06/1997	3600	565.0	4.85	2.4E-15	4.40	2.2E-15	1.1E-07	~2.8	~1.4E-03	~9.6E-16	8.49	4.2E-15
R-M-3-AIR	07/1997	3600	675.0	2.95	1.2E-15	2.60	1.1E-15	5.7E-08	~2.5	~1.0E-03	~6.9E-16	7.45	3.1E-15
R-M-3-AIR	08/1997	3600	620.0	2.48	1.1E-15	2.49	1.1E-15	5.7E-08	~2.3	~1.0E-03	~6.9E-16	11.77	5.3E-15
R-M-3-AIR	09/1997	3600	598.0	0.71	3.3E-16	0.99	4.6E-16	2.4E-08	~1.1	~5.1E-04	~3.5E-16	3.80	1.8E-15
R-M-3-AIR	10/1997	3600	695.0	1.62	6.5E-16	1.80	7.2E-16	3.7E-08	~1.8	~7.2E-04	~4.9E-16	9.09	3.6E-15
R-M-3-AIR	11/1997	3600	805.0	1.07	3.7E-16	1.31	4.5E-16	2.3E-08	1.7	5.9E-04	4.1E-16	12.65	4.4E-15
R-M-3-AIR	12/1997	3600	650.0	0.45	1.9E-16	0.59	2.5E-16	1.3E-08	~0.97	~4.1E-04	~2.8E-16	7.04	3.0E-15
R-M-5-AIR	06/1997	3600	429.0	0.69	4.5E-16	0.75	4.9E-16	2.5E-08	~1.0	~6.5E-04	~4.5E-16	3.96	2.6E-15
R-M-5-AIR	07/1997	3600	442.0	1.49	9.4E-16	1.19	7.5E-16	3.9E-08	~1.4	~8.8E-04	~6.0E-16	6.71	4.2E-15
R-M-5-AIR	08/1997	3600	722.0	0.80	3.1E-16	0.91	3.5E-16	1.8E-08	~1.3	~5.0E-04	~3.4E-16	7.80	3.0E-15
R-M-5-AIR	09/1997	3600	597.0	0.67	3.1E-16	0.55	2.6E-16	1.3E-08	~0.94	~4.4E-04	~3.0E-16	5.29	2.5E-15
R-M-5-AIR	10/1997	3600	696.0	0.89	3.6E-16	1.00	4.0E-16	2.1E-08	~1.6	~6.4E-04	~4.4E-16	9.82	3.9E-15
R-M-5-AIR	11/1997	3600	413.0	0.60	4.0E-16	0.71	4.8E-16	2.5E-08	1.3	8.7E-04	6.0E-16	8.30	5.6E-15
R-M-5-AIR	12/1997	3600	650.0	0.23	9.8E-17	0.19	8.1E-17	4.2E-09	~0.35	~1.5E-04	~1.0E-16	2.02	8.6E-16

<sup>a</sup> A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

<sup>b</sup> L/h = liters per hour.

<sup>c</sup> pCi/F = picocuries per filter.

<sup>d</sup> pg/mL = picograms per milliliter. The conversion of thorium-230 concentrations between microcuries and picograms assumed equilibrium and an activity of 0.0194  $\mu$ Ci/ $\mu$ g.

<sup>e</sup>  $\mu$ g/F = micrograms per filter.

<sup>f</sup> The conversion of uranium concentrations between microcuries per milliliter and micrograms per cubic meter assumed equilibrium and an activity of 0.687 pCi/ $\mu$ g.

Table A-13 (continued). Radioparticulate Air Sample Results for 1997

Sample Location	Sample Date	Flow Rate (L/h) <sup>b</sup>	Sample Time (hours)	Radium-226		Thorium-230			Uranium		Polonium-210	
				(pCi/F) <sup>c</sup>	( $\mu$ Ci/mL)	(pCi/F)	( $\mu$ Ci/mL)	(pg/mL) <sup>d</sup>	( $\mu$ g/F) <sup>e</sup>	( $\mu$ g/m <sup>3</sup> )	( $\mu$ Ci/mL) <sup>f</sup>	(pCi/F) ( $\mu$ Ci/mL)
R-M-6-AIR	04/1997	3600	308.0	0.64	5.8E-16	0.11	9.9E-17	5.1E-09	<0.40	<3.6E-04	<2.5E-16	1.61 1.5E-15
R-M-6-AIR	05/1997	3600	887.0	0.78	2.4E-16	0.25	7.8E-17	4.0E-09	-1.1	-3.4E-04	-2.3E-16	12.38 3.9E-15
R-M-6-AIR	06/1997	3600	600.0	0.90	4.2E-16	0.75	3.5E-16	1.8E-08	-1.0	-4.6E-04	-3.2E-16	6.89 3.2E-15
R-M-6-AIR	07/1997	3600	839.0	0.97	3.2E-16	0.89	2.9E-16	1.5E-08	-2.0	-6.6E-04	-4.5E-16	4.94 1.6E-15
R-M-6-AIR	08/1997	3600	719.0	1.19	4.6E-16	0.98	3.8E-16	2.0E-08	-1.3	-5.0E-04	-3.4E-16	10.71 4.1E-15
R-M-6-AIR	09/1997	3600	600.0	0.60	2.8E-16	0.52	2.4E-16	1.2E-08	-0.84	-3.9E-04	-2.7E-16	6.30 2.9E-15
R-M-6-AIR	10/1997	3600	696.0	0.65	2.6E-16	0.77	3.1E-16	1.6E-08	-1.2	-4.8E-04	-3.3E-16	9.71 3.9E-15
R-M-6-AIR	11/1997	3600	856.0	1.77	5.7E-16	0.94	3.1E-16	1.6E-08	1.4	4.5E-04	3.1E-16	15.00 4.9E-15
R-M-6-AIR	12/1997	3600	650.0	0.42	1.8E-16	0.37	1.6E-16	8.2E-09	-0.77	-3.3E-04	-2.3E-16	7.94 3.4E-15
R-M-7-AIR	04/1997	3600	291.0	0.29	2.8E-16	0.11	1.1E-16	5.7E-09	<0.40	<3.8E-04	<2.6E-16	1.55 1.5E-15
R-M-7-AIR	05/1997	3600	888.0	0.39	1.2E-16	0.17	5.3E-17	2.7E-09	-0.99	-3.1E-04	-2.1E-16	11.00 3.4E-15
R-M-7-AIR	06/1997	3600	601.0	0.36	1.7E-16	0.27	1.2E-16	6.2E-09	-0.72	-3.3E-04	-2.3E-16	5.48 2.5E-15
R-M-7-AIR	07/1997	3600	838.0	0.62	2.1E-16	0.41	1.4E-16	7.2E-09	-1.5	-5.0E-04	-3.4E-16	8.88 2.9E-15
R-M-7-AIR	08/1997	3600	719.0	0.35	1.4E-16	0.38	1.5E-16	7.7E-09	-0.82	-3.2E-04	-2.2E-16	8.78 3.4E-15
R-M-7-AIR	09/1997	3600	604.0	0.36	1.7E-16	0.30	1.4E-16	7.2E-09	-0.62	-2.9E-04	-2.0E-16	5.53 2.5E-15
R-M-7-AIR	10/1997	3600	696.0	0.28	1.1E-16	0.46	1.8E-16	9.3E-09	-0.85	-3.4E-04	-2.3E-16	9.30 3.7E-15
R-M-7-AIR	11/1997	3600	884.0	0.35	1.1E-16	0.40	1.3E-16	6.7E-09	1.0	3.1E-04	2.1E-16	15.23 4.8E-15
R-M-7-AIR	12/1997	3600	650.0	0.23	9.8E-17	0.35	1.5E-16	7.7E-09	-0.69	-2.9E-04	-2.0E-16	8.54 3.6E-15

<sup>a</sup> A "--" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

<sup>b</sup> L/h = liters per hour.

<sup>c</sup> pCi/F = picocuries per filter.

<sup>d</sup> pg/mL = picograms per milliliter. The conversion of thorium-230 concentrations between microcuries and picograms assumed equilibrium and an activity of 0.0194  $\mu$ Ci/ $\mu$ g.

<sup>e</sup>  $\mu$ g/F = micrograms per filter.

<sup>f</sup> The conversion of uranium concentrations between microcuries per milliliter and micrograms per cubic meter assumed equilibrium and an activity of 0.687 pCi/ $\mu$ g.

Table A-13 (continued). Radioparticulate Air Sample Results for 1997

Sample Location	Sample Date	Flow Rate (L/h) <sup>b</sup>	Sample Time (hours)	Radium-226		Thorium-230			Uranium		Polonium-210	
				(pCi/F) <sup>c</sup>	( $\mu$ Ci/mL)	(pCi/F)	( $\mu$ Ci/mL)	(pg/mL) <sup>d</sup>	( $\mu$ g/F) <sup>e</sup>	( $\mu$ g/m <sup>3</sup> )	( $\mu$ Ci/mL) <sup>f</sup>	(pCi/F) (pCi/mL)
R-M-8-AIR	05/1997	3600	415.0	0.46	3.1E-16	0.12	8.0E-17	4.1E-09	-1.0	-6.7E-04	-4.6E-16	5.66 3.8E-15
R-M-8-AIR	06/1997	3600	457.0	0.32	1.9E-16	0.40	2.4E-16	1.2E-08	-0.71	-4.3E-04	-3.0E-16	3.33 2.0E-15
R-M-8-AIR	07/1997	3600	837.0	0.80	2.7E-16	0.60	2.0E-16	1.0E-08	-1.0	-3.3E-04	-2.3E-16	6.30 2.1E-15
R-M-8-AIR	08/1997	3600	693.0	0.62	2.5E-16	0.61	2.4E-16	1.2E-08	-0.95	-3.8E-04	-2.6E-16	7.70 3.1E-15
R-M-8-AIR	09/1997	3600	601.0	0.75	3.5E-16	0.43	2.0E-16	1.0E-08	-0.73	-3.4E-04	-2.3E-16	4.38 2.0E-15
R-M-8-AIR	10/1997	3600	695.0	0.55	2.2E-16	0.59	2.4E-16	1.2E-08	-1.1	-4.4E-04	-3.0E-16	9.12 3.6E-15
R-M-8-AIR	11/1997	3600	738.0	0.59	2.2E-16	0.55	2.1E-16	1.1E-08	1.2	4.5E-04	3.1E-16	11.19 4.2E-15
R-M-8-AIR	12/1997	3600	650.0	0.19	8.1E-17	0.27	1.2E-16	6.2E-09	-0.71	-3.0E-04	-2.1E-16	7.22 3.1E-15
R-M-8A-AIR	06/1997	3600	456.0	0.48	2.9E-16	0.32	1.9E-16	9.8E-09	-0.71	-4.3E-04	-3.0E-16	4.32 2.6E-15
R-M-8A-AIR	07/1997	3600	837.0	1.12	3.7E-16	0.78	2.6E-16	1.3E-08	-1.3	-4.3E-04	-3.0E-16	6.43 2.1E-15
R-M-8A-AIR	08/1997	3600	718.0	0.79	3.1E-16	0.55	2.1E-16	1.1E-08	-0.99	-3.8E-04	-2.6E-16	9.27 3.6E-15
R-M-8A-AIR	09/1997	3600	601.0	1.00	4.6E-16	0.48	2.2E-16	1.1E-08	-0.80	-3.7E-04	-2.5E-16	6.00 2.8E-15
R-M-8A-AIR	10/1997	3600	695.0	0.48	1.9E-16	0.68	2.7E-16	1.4E-08	-1.1	-4.4E-04	-3.0E-16	9.77 3.9E-15
R-M-8A-AIR	11/1997	3600	884.0	0.82	2.6E-16	0.93	2.9E-16	1.5E-08	1.6	5.0E-04	3.4E-16	16.13 5.1E-15
R-M-8A-AIR	12/1997	3600	650.0	0.23	9.8E-17	0.25	1.1E-16	5.7E-09	-0.74	-3.2E-04	-2.2E-16	7.84 3.4E-15

<sup>a</sup> A "-" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

<sup>b</sup> L/h = liters per hour.

<sup>c</sup> pCi/F = picocuries per filter.

<sup>d</sup> pg/mL = picograms per milliliter. The conversion of thorium-230 concentrations between microcuries and picograms assumed equilibrium and an activity of 0.0194  $\mu$ Ci/ $\mu$ g.

<sup>e</sup>  $\mu$ g/F = micrograms per filter.

<sup>f</sup> The conversion of uranium concentrations between microcuries per milliliter and micrograms per cubic meter assumed equilibrium and an activity of 0.687 pCi/ $\mu$ g.

Table A-13 (continued). Radioparticulate Air Sample Results for 1997

Sample Location	Sample Date	Flow Rate (L/h) <sup>b</sup>	Sample Time (hours)	Radium-226		Thorium-230			Uranium		Polonium-210	
				(pCi/F) <sup>c</sup>	( $\mu$ Ci/mL)	(pCi/F)	( $\mu$ Ci/mL)	(pg/mL) <sup>d</sup>	( $\mu$ g/F) <sup>e</sup>	( $\mu$ g/m <sup>3</sup> )	( $\mu$ Ci/mL) <sup>f</sup>	(pCi/F) (pCi/mL)
R-M-9-AIR	04/1997	3600	307.0	0.34	3.1E-16	<0.15	<1.4E-16	<7.2E-09	<0.40	<3.6E-04	<2.5E-16	1.62 1.5E-15
R-M-9-AIR	05/1997	3600	654.0	0.35	1.5E-16	0.12	5.1E-17	2.6E-09	-0.87	-3.7E-04	-2.5E-16	6.99 3.0E-15
R-M-9-AIR	06/1997	3600	573.0	0.28	1.4E-16	0.34	1.6E-16	8.2E-09	-0.93	-4.5E-04	-3.1E-16	5.20 2.5E-15
R-M-9-AIR	07/1997	3600	797.0	0.43	1.5E-16	0.31	1.1E-16	5.7E-09	-1.1	-3.8E-04	-2.6E-16	6.59 2.3E-15
R-M-9-AIR	08/1997	3600	718.0	0.43	1.7E-16	0.25	9.7E-17	5.0E-09	-0.79	-3.1E-04	-2.1E-16	5.32 2.1E-15
R-M-9-AIR	09/1997	3600	603.0	0.37	1.7E-16	0.30	1.4E-16	7.2E-09	-0.63	-2.9E-04	-2.0E-16	2.87 1.3E-15
R-M-9-AIR	10/1997	3600	695.0	0.46	1.8E-16	0.28	1.1E-16	5.7E-09	-0.86	-3.4E-04	-2.3E-16	4.90 2.0E-15
R-M-9-AIR	11/1997	3600	810.0	0.32	1.1E-16	0.37	1.3E-16	6.7E-09	1.0	3.4E-04	2.3E-16	7.76 2.7E-15
R-M-9-AIR	12/1997	3600	650.0	0.24	1.0E-16	0.16	6.8E-17	3.5E-09	-0.51	-2.2E-04	-1.5E-16	4.23 1.8E-15

<sup>a</sup> A "--" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

<sup>b</sup> L/h = liters per hour.

<sup>c</sup> pCi/F = picocuries per filter.

<sup>d</sup> pg/mL = picograms per milliliter. The conversion of thorium-230 concentrations between microcuries and picograms assumed equilibrium and an activity of 0.0194  $\mu$ Ci/ $\mu$ g.

<sup>e</sup>  $\mu$ g/F = micrograms per filter.

<sup>f</sup> The conversion of uranium concentrations between microcuries per milliliter and micrograms per cubic meter assumed equilibrium and an activity of 0.687 pCi/ $\mu$ g.

*Table A-14. Environmental Radiation Exposure Data for Monticello, First Quarter 1997*

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-24	05/08/1997	01/07/1997	04/08/1997	91

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-10	R-M-1-TLD	21.9	0.2	88
GJ-17	R-M-1-TLD <sup>a</sup>	24.4	0.3	98
GJ-64	R-M-2-TLD	18.0	0.2	72
GJ-20	R-M-2-TLD <sup>a</sup>	24.8	0.3	99
GJ-62	R-M-3-TLD	22.7	0.2	91
GJ-48	R-M-3-TLD <sup>a</sup>	21.5	0.2	86
GJ-11	R-M-4-TLD	23.1	0.3	93
GJ-23	R-M-4-TLD <sup>a</sup>	25.0	0.3	100
GJ-65	R-M-5-TLD	23.9	0.3	96
GJ-44	R-M-5-TLD <sup>a</sup>	23.6	0.3	95
GJ-13	R-M-6-TLD	19.7	0.2	79
GJ-8	R-M-6-TLD <sup>a</sup>	19.7	0.2	79
GJ-19	R-M-7-TLD	16.2	0.2	65
GJ-16	R-M-7-TLD <sup>a</sup>	18.8	0.2	75
GJ-38	TLD-M-02	20.4	0.2	82
GJ-30	TLD-M-03	20.5	0.2	82
GJ-61	TLD-M-06	84.9	0.9	341
GJ-70	TLD-M-06 <sup>a</sup>	79.9	0.9	320
GJ-15	TLD-M-07	23.4	0.3	94
GJ-25	TLD-M-07 <sup>a</sup>	24.0	0.3	96
GJ-35	TLD-M-08	18.4	0.2	74
GJ-1	TLD-M-08 <sup>a</sup>	20.4	0.2	82
GJ-26	TLD-M-09	21.8	0.2	87
GJ-50	TLD-M-09 <sup>a</sup>	19.6	0.2	79
GJ-3	TLD-M-10	23.6	0.3	95
GJ-37	TLD-M-10 <sup>a</sup>	22.9	0.3	92
GJ-6	TLD-M-11	37.0	0.4	148
GJ-12	TLD-M-11 <sup>a</sup>	30.5	0.3	122
GJ-49	TLD-M-16	18.0	0.2	72

<sup>a</sup> Duplicate sample.

*Table A-14 (continued). Environmental Radiation Exposure Data for Monticello,  
First Quarter 1997*

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-24	05/08/1997	01/07/1997	04/08/1997	91

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-40	TLD-M-17	20.3	0.2	81
GJ-21	TLD-M-18	24.7	0.3	99
GJ-63	TLD-M-19	16.2	0.2	65
GJ-54	TLD-M-20	18.4	0.2	74
GJ-56	TLD-M-21	17.4	0.2	70
GJ-28	TLD-M-22	18.3	0.2	73
GJ-33	TLD-M-23	19.7	0.2	79
GJ-58	TLD-M-24	16.1	0.2	65
GJ-27	TLD-M-25	20.4	0.2	82
GJ-47	TLD-M-26	16.2	0.2	65
GJ-46	TLD-M-27	20.4	0.2	82
GJ-39	TLD-M-28	21.5	0.2	86
GJ-31	TLD-M-29	16.3	0.2	65
GJ-36	TLD-M-30	20.7	0.2	83
GJ-45	TLD-M-31	16.5	0.2	66
GJ-59	TLD-M-32	16.5	0.2	66
GJ-53	TLD-M-33	17.5	0.2	70
GJ-68	TLD-M-34	16.2	0.2	65
GJ-43	TLD-M-35	17.5	0.2	70
GJ-51	TLD-M-36	17.9	0.2	72
GJ-14	TLD-M-37	20.7	0.2	83
GJ-29	TLD-M-37 <sup>a</sup>	22.4	0.2	90
GJ-4	TLD-M-38	27.9	0.3	112
GJ-9	TLD-M-38 <sup>a</sup>	22.8	0.3	91
GJ-7	TLD-M-39	28.0	0.3	112
GJ-2	TLD-M-39 <sup>a</sup>	26.6	0.3	107
GJ-67	TLD-M-40	27.1	0.3	109
GJ-22	TLD-M-40 <sup>a</sup>	37.4	0.4	150
GJ-41	TLD-M-41	18.3	0.2	73

<sup>a</sup> Duplicate sample.

*Table A-14 (continued). Environmental Radiation Exposure Data for Monticello,  
First Quarter 1997*

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-24	05/08/1997	01/07/1997	04/08/1997	91

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-34	TLD-M-42	21.8	0.2	87
GJ-18	TLD-M-43	23.5	0.3	94
GJ-24	TLD-M-44	24.0	0.3	96
GJ-66	TLD-M-45	18.4	0.2	74
GJ-60	TLD-M-46	18.0	0.2	72
GJ-32	TLD-M-47	27.9	0.3	112
GJ-57	TLD-M-47 <sup>a</sup>	27.8	0.3	112

<sup>a</sup> Duplicate sample.

Table A-15. Environmental Radiation Exposure Data for Monticello, Second Quarter 1997

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-25	07/30/1997	04/08/1997	07/01/1997	84

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-42	R-M-1-TLD	24.9	0.3	108
GJ-52	R-M-2-TLD	22.7	0.3	99
GJ-53	R-M-2-TLD <sup>a</sup>	21.6	0.3	94
GJ-11	R-M-3-TLD	29.5	0.4	128
GJ-14	R-M-3-TLD <sup>a</sup>	30.1	0.4	131
GJ-9	R-M-4-TLD	29.6	0.4	129
GJ-12	R-M-4-TLD <sup>a</sup>	28.0	0.3	122
GJ-10	R-M-5-TLD	28.0	0.3	122
GJ-3	R-M-5-TLD <sup>a</sup>	26.6	0.3	116
GJ-45	R-M-6-TLD	23.3	0.3	101
GJ-55	R-M-6-TLD <sup>a</sup>	22.1	0.3	96
GJ-17	R-M-7-TLD	23.6	0.3	103
GJ-28	R-M-7-TLD <sup>a</sup>	22.0	0.3	96
GJ-65	R-M-8-TLD	25.0	0.3	109
GJ-68	R-M-8-TLD <sup>a</sup>	21.9	0.3	95
GJ-37	R-M-9-TLD	26.6	0.3	116
GJ-70	R-M-9-TLD <sup>a</sup>	21.5	0.3	93
GJ-29	TLD-M-02	26.3	0.3	114
GJ-38	TLD-M-02 <sup>a</sup>	27.2	0.3	118
GJ-16	TLD-M-03	25.1	0.3	109
GJ-27	TLD-M-03 <sup>a</sup>	30.4	0.4	132
GJ-56	TLD-M-06	122.3	1.5	531
GJ-57	TLD-M-06 <sup>a</sup>	123.5	1.5	537
GJ-18	TLD-M-07	35.6	0.4	155
GJ-31	TLD-M-07 <sup>a</sup>	30.3	0.4	132
GJ-39	TLD-M-08	28.2	0.3	123
GJ-51	TLD-M-08 <sup>a</sup>	21.9	0.3	95
GJ-26	TLD-M-09	29.4	0.4	128
GJ-35	TLD-M-09 <sup>a</sup>	28.0	0.3	122

<sup>a</sup> Duplicate sample.

*Table A-15 (continued). Environmental Radiation Exposure Data for Monticello,  
Second Quarter 1997*

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-25	07/30/1997	04/08/1997	07/01/1997	84

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-40	TLD-M-11	49.5	0.6	215
GJ-66	TLD-M-11 <sup>a</sup>	48.8	0.6	212
GJ-44	TLD-M-16	25.7	0.3	112
GJ-49	TLD-M-18	24.8	0.3	108
GJ-47	TLD-M-20	24.8	0.3	108
GJ-23	TLD-M-22	28.1	0.3	122
GJ-5	TLD-M-24	32.8	0.4	143
GJ-48	TLD-M-26	26.1	0.3	113
GJ-22	TLD-M-28	31.1	0.4	135
GJ-24	TLD-M-30	27.9	0.3	121
GJ-30	TLD-M-32	28.1	0.3	122
GJ-25	TLD-M-34	25.9	0.3	113
GJ-4	TLD-M-37	41.2	0.5	179
GJ-67	TLD-M-37 <sup>a</sup>	34.6	0.4	150
GJ-20	TLD-M-38	35.6	0.4	155
GJ-61	TLD-M-38 <sup>a</sup>	29.5	0.4	128
GJ-33	TLD-M-39	32.6	0.4	142
GJ-50	TLD-M-39 <sup>a</sup>	28.2	0.3	123
GJ-32	TLD-M-40	41.2	0.5	179
GJ-63	TLD-M-40 <sup>a</sup>	39.2	0.5	170
GJ-21	TLD-M-41	31.3	0.4	136
GJ-8	TLD-M-41 <sup>a</sup>	29.9	0.4	130
GJ-1	TLD-M-42	27.0	0.3	117
GJ-6	TLD-M-42 <sup>a</sup>	28.7	0.3	125
GJ-15	TLD-M-43	27.0	0.3	117
GJ-60	TLD-M-43 <sup>a</sup>	25.3	0.3	110
GJ-2	TLD-M-44	28.2	0.3	123
GJ-64	TLD-M-44 <sup>a</sup>	25.3	0.3	110

<sup>a</sup> Duplicate sample.

*Table A-15 (continued). Environmental Radiation Exposure Data for Monticello,  
Second Quarter 1997*

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-25	07/30/1997	04/08/1997	07/01/1997	84

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-19	TLD-M-45	27.2	0.3	118
GJ-43	TLD-M-45 <sup>a</sup>	25.2	0.3	110
GJ-13	TLD-M-46	30.0	0.4	130
GJ-59	TLD-M-46 <sup>a</sup>	25.8	0.3	112
GJ-7	TLD-M-47	53.7	0.6	233
GJ-58	TLD-M-47 <sup>a</sup>	44.9	0.5	195

<sup>a</sup> Duplicate sample.

*Table A-16. Environmental Radiation Exposure Data for Monticello, Third Quarter 1997*

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-26	11/03/1997	07/02/1997	09/29/1997	90

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-15	R-M-1-TLD	27.3	0.3	111
GJ-24	R-M-2-TLD	27.7	0.3	112
GJ-26	R-M-2-TLD <sup>a</sup>	25.7	0.3	104
GJ-16	R-M-3-TLD	35.0	0.4	142
GJ-14	R-M-3-TLD <sup>a</sup>	33.7	0.4	137
GJ-23	R-M-4-TLD	31.7	0.4	129
GJ-35	R-M-5-TLD	26.1	0.3	106
GJ-66	R-M-5-TLD <sup>a</sup>	29.1	0.3	118
GJ-28	R-M-6-TLD	27.8	0.3	113
GJ-22	R-M-6-TLD <sup>a</sup>	31.9	0.4	129
GJ-10	R-M-7-TLD	22.0	0.2	89
GJ-40	R-M-7-TLD <sup>a</sup>	21.4	0.2	87
GJ-12	R-M-8-TLD	26.2	0.3	106
GJ-6	R-M-8-TLD <sup>a</sup>	31.9	0.4	129
GJ-59	R-M-9-TLD	23.5	0.3	95
GJ-67	R-M-9-TLD <sup>a</sup>	24.9	0.3	101
GJ-3	TLD-M-03	30.0	0.3	122
GJ-8	TLD-M-03 <sup>a</sup>	27.4	0.3	111
GJ-51	TLD-M-06	148.4	1.6	602
GJ-60	TLD-M-06 <sup>a</sup>	144.2	1.6	585
GJ-46	TLD-M-07	34.7	0.4	141
GJ-4	TLD-M-07 <sup>a</sup>	40.2	0.4	163
GJ-34	TLD-M-09	28.1	0.3	114
GJ-52	TLD-M-09 <sup>a</sup>	26.4	0.3	107
GJ-39	TLD-M-11	56.0	0.6	227
GJ-43	TLD-M-16	25.7	0.3	104
GJ-31	TLD-M-18	28.7	0.3	116
GJ-62	TLD-M-20	32.8	0.4	133

<sup>a</sup>Duplicate sample.

*Table A-16 (continued). Environmental Radiation Exposure Data for Monticello,  
Third Quarter 1997*

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-26	11/03/1997	07/02/1997	09/29/1997	90

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-69	TLD-M-22	24.4	0.3	99
GJ-36	TLD-M-24	29.5	0.3	120
GJ-1	TLD-M-26	26.7	0.3	108
GJ-49	TLD-M-28	30.8	0.3	125
GJ-11	TLD-M-30	27.5	0.3	112
GJ-44	TLD-M-32	27.7	0.3	112
GJ-20	TLD-M-34	32.8	0.4	133
GJ-42	TLD-M-37	40.5	0.5	164
GJ-47	TLD-M-38	32.1	0.4	130
GJ-33	TLD-M-39	32.7	0.4	133
GJ-27	TLD-M-40	33.8	0.4	137
GJ-64	TLD-M-41	29.8	0.3	121
GJ-54	TLD-M-42	28.8	0.3	117
GJ-48	TLD-M-43	34.2	0.4	139
GJ-38	TLD-M-44	36.1	0.4	146
GJ-21	TLD-M-45	31.9	0.4	129
GJ-57	TLD-M-46	30.4	0.3	123
GJ-29	TLD-M-47	43.9	0.5	178
GJ-63	TLD-M-47 <sup>a</sup>	45.5	0.5	185

*Table A-17. Environmental Radiation Exposure Data for Monticello, Fourth Quarter 1997*

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-27	02/05/1998	09/29/1997	12/29/1997	91

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-24	R-M-1-TLD	29.0	0.3	116
GJ-40	R-M-2-TLD	26.5	0.3	106
GJ-28	R-M-3-TLD	39.0	0.4	156
GJ-35	R-M-3-TLD <sup>a</sup>	43.7	0.5	175
GJ-27	R-M-4-TLD	30.1	0.3	121
GJ-13	R-M-5-TLD	28.4	0.3	114
GJ-26	R-M-6-TLD	32.3	0.4	130
GJ-20	R-M-7-TLD	24.1	0.3	97
GJ-34	R-M-7-TLD <sup>a</sup>	23.3	0.3	93
GJ-16	R-M-8-TLD	26.2	0.3	105
GJ-22	R-M-9-TLD	27.9	0.3	112
GJ-14	TLD-M-03	26.0	0.3	104
GJ-25	TLD-M-06	141.7	1.6	568
GJ-23	TLD-M-06 <sup>a</sup>	163.0	1.8	654
GJ-19	TLD-M-07	31.4	0.3	126
GJ-38	TLD-M-08	28.4	0.3	114
GJ-17	TLD-M-09	30.2	0.3	121
GJ-21	TLD-M-11	81.9	0.9	329
GJ-9	TLD-M-16	28.4	0.3	114
GJ-7	TLD-M-18	30.8	0.3	124
GJ-4	TLD-M-20	27.1	0.3	109
GJ-8	TLD-M-22	29.4	0.3	118
GJ-3	TLD-M-24	27.3	0.3	110
GJ-10	TLD-M-26	29.2	0.3	117
GJ-39	TLD-M-28	28.9	0.3	116
GJ-11	TLD-M-30	26.3	0.3	105
GJ-2	TLD-M-32	28.4	0.3	114
GJ-29	TLD-M-34	28.5	0.3	114

<sup>a</sup> Duplicate sample.

*Table A-17 (continued). Environmental Radiation Exposure Data for Monticello.  
Fourth Quarter 1997*

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-27	02/05/1998	09/29/1997	12/29/1997	91

TLD ID	Field Location	Exposure for Quarter (mrem)	Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-15	TLD-M-37	43.4	0.5	174
GJ-30	TLD-M-38	33.2	0.4	133
GJ-19	TLD-M-39	31.4	0.3	126
GJ-31	TLD-M-40	32.3	0.4	130
GJ-12	TLD-M-41	28.0	0.3	112
GJ-37	TLD-M-42	30.4	0.3	122
GJ-6	TLD-M-43	38.5	0.4	154
GJ-1	TLD-M-44	35.0	0.4	140
GJ-33	TLD-M-45	29.4	0.3	118
GJ-5	TLD-M-46	34.7	0.4	139
GJ-18	TLD-M-47	57.9	0.6	232

<sup>a</sup> Duplicate sample.

Table A-18. Surface-Water Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Alkalinity (as CaCO <sub>3</sub> ) (ppm)	Alpha (pCi/L) <sup>b</sup>	Alpha <sup>c</sup> (pCi/L) <sup>b</sup>	As (μg/L)	As <sup>d</sup> (μg/L)	Beta (pCi/L) <sup>b</sup>	Beta <sup>c</sup> (pCi/L) <sup>b</sup>	Ca (μg/L)
SW92-03	NDB-651, NDB-652	10/14/1997	183	<8.64	-2.13	-2.3	-2.3	<8.53	<1.66 <sup>e</sup>	258000
SW92-04	NDB-672, NDB-673	10/17/1997	232	11.06	-10.68	<2.2 <sup>e</sup>	-12.4	<10.15	-8.53	301000
SW92-05	NDB-674, NDB-675	10/17/1997	222	<10.37	-10.37	<2.2 <sup>e</sup>	-2.6	<10.14	-8.67	300000
SW92-06	NDB-669, NDB-670	10/16/1997	228	44.86	-41.85	<2.2 <sup>e</sup>	<2.2 <sup>e</sup>	27.95	-42.18	305000
SW92-07	NDB-662, NDB-663	10/15/1997	230	65.73	-67.68	-2.3	<2.2 <sup>e</sup>	39.15	-64.68	292000
SW92-08	NDB-655, NDB-656	10/15/1997	242	57.63	-60.24	-2.6	<2.2 <sup>e</sup>	46.31	-59.36	286000
SW97-01	NDB-667	10/16/1997	263	No Data	No Data	<2.2 <sup>e</sup>	No Data	No Data	No Data	309000
	NDB-666	10/16/1997	263	No Data	No Data	<2.2 <sup>e</sup>	No Data	No Data	No Data	307000
SW97-02	NDB-660	10/15/1997	231	No Data	No Data	<2.2 <sup>e</sup>	No Data	No Data	No Data	285000
SW97-03	NDB-658	10/15/1997	216	No Data	No Data	<2.2 <sup>e</sup>	No Data	No Data	No Data	276000
SW97-04	NDB-659	10/15/1997	227	No Data	No Data	<2.2 <sup>e</sup>	No Data	No Data	No Data	276000
SW97-05	NDB-657	10/15/1997	249	No Data	No Data	<2.2 <sup>e</sup>	No Data	No Data	No Data	286000
SW97-05E	NDB-685	10/22/1997	245	No Data	No Data	<2.2 <sup>e</sup>	No Data	No Data	No Data	278000
Sorenson	NDB-661, NDB-664	10/16/1997	259	43.34	-65.73	<2.2 <sup>e</sup>	<2.2 <sup>e</sup>	40.01	-71.05	312000
	NDB-665	10/16/1997	259	64.02	No Data	<2.2 <sup>e</sup>	No Data	49.45	No Data	308000
W-4	NDB-653, NDB-654	10/14/1997	209	11.36	-16.43	-3.3	<2.2 <sup>e</sup>	<11.04	-15.05	301000

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "-" indicates an estimated value. An "R" indicates that the result was determined unusable through data validation. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> The values listed multiplied by 10<sup>-9</sup> will result in microcuries per milliliter.

<sup>c</sup> Results determined using EPA Method 00-02-01; a method for determining gross alpha (and gross beta) in drinking water using coprecipitation.

<sup>d</sup> Sample was unfiltered.

<sup>e</sup> Estimated.

Table A-18 (continued). Surface-Water Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Ca <sup>b</sup> (µg/L)	CDT <sup>c</sup> (µmhos/cm)	Cl (µg/L)	Co (µg/L)	Co <sup>b</sup> (µg/L)	Cu (µg/L)	Cu <sup>b</sup> (µg/L)	F (µg/L)
SW92-03	NDB-651, NDB-652	10/14/1997	258000	1386	6160	<1.1	<1.1	-3.3	<2.2	-195
SW92-04	NDB-672, NDB-673	10/17/1997	308000	1660	9350	<1.1	<1.1	<2.2	<2.2	-173
SW92-05	NDB-674, NDB-675	10/17/1997	303000	1663	9490	<1.1	<1.1	<2.2	<2.2	-191
SW92-06	NDB-669, NDB-670	10/16/1997	301000	1715	18400	-1.9	<1.1	<2.2	<2.2	-200
SW92-07	NDB-662, NDB-663	10/15/1997	289000	1833	33100	<1.1	<1.1	<2.2	<2.2	204
SW92-08	NDB-655, NDB-656	10/15/1997	287000	1650	33400	<1.1	<1.1	-3.0	-2.4	-197
SW97-01	NDB-667	10/16/1997	No Data	1910	33300	<1.1	No Data	<2.2	No Data	261
	NDB-666	10/16/1997	No Data	1910	33000	<1.1	No Data	-2.5	No Data	212
SW97-02	NDB-660	10/15/1997	No Data	1816	32500	<1.1	No Data	<2.2	No Data	-187
SW97-03	NDB-658	10/15/1997	No Data	1769	32500	<1.1	No Data	<2.2	No Data	-192
SW97-04	NDB-659	10/15/1997	No Data	1768	32600	<1.1	No Data	<2.2	No Data	200
SW97-05	NDB-657	10/15/1997	No Data	1825	34100	<1.1	No Data	-3.0	No Data	205
SW97-05E	NDB-685	10/22/1997	No Data	1748	33700	<1.1	No Data	-2.5	No Data	-199
Sorenson	NDB-661, NDB-664	10/16/1997	306000	1224	32800	<1.1	<1.1	<2.2	<2.2	-194
	NDB-665	10/16/1997	No Data	1224	32500	<1.1	No Data	<2.2	No Data	-190
W-4	NDB-653, NDB-654	10/14/1997	296000	1608	10800	-1.1	<1.1	4.2	4.0	-194

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "-" indicates an estimated value. An "R" indicates that the result was determined unusable through data validation. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> Sample was unfiltered.

<sup>c</sup> Conductivity in micromhos per centimeter.

Table A-18 (continued). Surface-Water Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	K (µg/L)	K <sup>b</sup> (µg/L)	Mg (µg/L)	Mg <sup>b</sup> (µg/L)	Mn (µg/L)	Mn <sup>b</sup> (µg/L)	Mo (µg/L)	Mo <sup>b</sup> (µg/L)
SW92-03	NDB-651, NDB-652	10/14/1997	2560	2560	34400	34200	31.2	34.1	2.5	2.4
SW92-04	NDB-672, NDB-673	10/17/1997	2660	2820	42700	44100	142	152	2.5	2.3
SW92-05	NDB-674, NDB-675	10/17/1997	2680	2750	43000	43100	129	137	2.6	2.5
SW92-06	NDB-669, NDB-670	10/16/1997	3570	3520	46800	46300	126	137	8.7	8.3
SW92-07	NDB-662, NDB-663	10/15/1997	4230	4240	50400	50200	103	103	15.6	15.6
SW92-08	NDB-655, NDB-656	10/15/1997	4040	4110	48200	49000	121	125	14.1	13.9
SW97-01	NDB-667	10/16/1997	4150	No Data	51700	No Data	177	No Data	16.4	No Data
	NDB-666	10/16/1997	4080	No Data	51000	No Data	175	No Data	16.2	No Data
SW97-02	NDB-660	10/15/1997	4220	No Data	49700	No Data	97.9	No Data	15.1	No Data
SW97-03	NDB-658	10/15/1997	4160	No Data	48500	No Data	110	No Data	14.8	No Data
SW97-04	NDB-659	10/15/1997	4180	No Data	48600	No Data	102	No Data	15.0	No Data
SW97-05	NDB-657	10/15/1997	4100	No Data	48700	No Data	112	No Data	14.5	No Data
SW97-05E	NDB-685	10/22/1997	4060	No Data	49000	No Data	78.1	No Data	15.1	No Data
Sorenson	NDB-661, NDB-664	10/16/1997	4140	4070	51800	50900	181	181	15.9	15.7
	NDB-665	10/16/1997	4080	No Data	51500	No Data	177	No Data	16.1	No Data
W-4	NDB-653, NDB-654	10/14/1997	2950	3000	42800	42200	126	132	4.5	4.6

<sup>a</sup>A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an estimated value. An "R" indicates that the result was determined unusable through data validation. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> Sample was unfiltered.

Table A-18 (continued). Surface-Water Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Na (µg/L)	Na <sup>b</sup> (µg/L)	NO <sub>3</sub> +NO <sub>2</sub> -N (µg/L)	Pb (µg/L)	Pb <sup>b</sup> (µg/L)	Pb-210 (pCi/L) <sup>d</sup>	pH	Ra226 (pCi/L)
SW92-03	NDB-651, NDB-652	10/14/1997	23100	23100	233	<1.1	<1.1	<0.90	8.15	<0.47
SW92-04	NDB-672, NDB-673	10/17/1997	33000	33800	269	<1.1	<1.1	<0.90	7.79	<0.35
SW92-05	NDB-674, NDB-675	10/17/1997	33300	33400	308	<1.1	<1.1	<0.90	7.81	<0.32
SW92-06	NDB-669, NDB-670	10/16/1997	52100	52200	273	<1.1	<1.1	<0.85	7.81	<0.37
SW92-07	NDB-662, NDB-663	10/15/1997	77000	77600	313	<1.1	<1.1	<0.90	8.32	<0.35
SW92-08	NDB-655, NDB-656	10/15/1997	76500	76500	303	<1.1	<1.1	<0.88	8.2	<0.40
SW97-01	NDB-667	10/16/1997	76400	No Data	No Data	<1.1	No Data	No Data	7.98	No Data
	NDB-666	10/16/1997	75300	No Data	No Data	<1.2	No Data	No Data	7.98	No Data
SW97-02	NDB-660	10/15/1997	76300	No Data	No Data	<1.1	No Data	No Data	8.20	No Data
SW97-03	NDB-658	10/15/1997	76200	No Data	No Data	<1.1	No Data	No Data	8.20	No Data
SW97-04	NDB-659	10/15/1997	76300	No Data	No Data	<1.1	No Data	No Data	8.25	No Data
SW97-05	NDB-657	10/15/1997	76600	No Data	No Data	<1.1	No Data	No Data	8.30	No Data
SW97-05E	NDB-685	10/22/1997	77000	No Data	No Data	<1.1	No Data	No Data	7.86	No Data
Sorenson	NDB-661, NDB-664	10/16/1997	77600	76000	433	<1.1	<1.1	<0.89	7.91	<0.33
	NDB-665	10/16/1997	76300	No Data	427	<1.1	No Data	<0.87	7.91	<0.36
W-4	NDB-653, NDB-654	10/14/1997	36100	35600	260	<1.1	<1.1	<0.90	8.32	<0.31

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an estimated value. An "R" indicates that the result was determined unusable through data validation. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> Sample was unfiltered.

<sup>c</sup> (Nitrate + nitrite) as nitrogen.

<sup>d</sup> The values listed multiplied by 10<sup>-9</sup> will result in microcuries per milliliter.

Table A-18 (continued). Surface-Water Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Rn-222 (pCi/L) <sup>b</sup>	Se (µg/L)	Se <sup>c</sup> (µg/L)	SO <sub>4</sub> (µg/L)	TDS <sup>d</sup> (mg/L)	Temperature (degrees C)	Th-230 (pCi/L) <sup>b</sup>	U (µg/L)
SW92-03	NDB-651, NDB-652	10/14/1997	<12	<2.2	<2.2	579000	1090	8.9	<0.80	3.2
SW92-04	NDB-672, NDB-673	10/17/1997	159	<2.2	<2.2	666000	1310	6.1	No Data	20.6
SW92-05	NDB-674, NDB-675	10/17/1997	76	<2.2	<2.2	674000	1320	6.6	No Data	20.8
SW92-06	NDB-669, NDB-670	10/16/1997	44	<2.2	<2.2	709000	1390	10.5	No Data	90.2
SW92-07	NDB-662, NDB-663	10/15/1997	126	<2.2	<2.2	730000	1410	11.1	No Data	152
SW92-08	NDB-655, NDB-656	10/15/1997	42	<2.2	<2.2	699000	1380	4.1	<0.80	143
SW97-01	NDB-667	10/16/1997	No Data	<2.2	No Data	765000	1550	7.6	No Data	164
	NDB-666	10/16/1997	No Data	<2.2	No Data	757000	1500	7.6	No Data	161
SW97-02	NDB-660	10/15/1997	No Data	<2.2	No Data	715000	1430	11.8	No Data	149
SW97-03	NDB-658	10/15/1997	No Data	<2.2	No Data	697000	1410	11.9	No Data	145
SW97-04	NDB-659	10/15/1997	No Data	<2.2	No Data	694000	1380	11.6	No Data	146
SW97-05	NDB-657	10/15/1997	No Data	<2.2	No Data	714000	1420	4.5	No Data	142
SW97-05E	NDB-685	10/22/1997	No Data	<2.2	No Data	736000	1380	8.0	No Data	145
Sorenson	NDB-661, NDB-664	10/16/1997	96	<2.2	<2.2	742000	1520	5.8	No Data	163
	NDB-665	10/16/1997	120	<2.2	No Data	740000	1520	5.8	No Data	161
W-4	NDB-653, NDB-654	10/14/1997	24	<2.2	<2.2	689000	1310	9.8	<0.80	34.5

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an estimated value. An "R" indicates that the result was determined unusable through data validation. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> The values listed multiplied by 10<sup>-9</sup> will result in microcuries per milliliter.

<sup>c</sup> Sample was unfiltered.

<sup>d</sup> Total dissolved solids.

Table A-18 (continued). Surface-Water Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	U <sup>b</sup> (µg/L)	V (µg/L)	V <sup>b</sup> (µg/L)	Zn (µg/L)	Zn <sup>b</sup> (µg/L)
SW92-03	NDB-651, NDB-652	10/14/1997	3.1	<1.1	<1.1	<2	<2
SW92-04	NDB-672, NDB-673	10/17/1997	20.8	-1.5	-2.7	<2	<2
SW92-05	NDB-674, NDB-675	10/17/1997	21.7	-1.8	-1.2	<2	<2
SW92-06	NDB-669, NDB-670	10/16/1997	89.6	8.0	8.7	<2	18.8
SW92-07	NDB-662, NDB-663	10/15/1997	151	-4.9	-5.8	<2	<2
SW92-08	NDB-655, NDB-656	10/15/1997	143	<1	<1	<2	<2
SW97-01	NDB-667	10/16/1997	No Data	-4.3	No Data	<2	No Data
	NDB-666	10/16/1997	No Data	-4.5	No Data	<2	No Data
SW97-02	NDB-660	10/15/1997	No Data	-4.5	No Data	<2	No Data
SW97-03	NDB-658	10/15/1997	No Data	-4.1	No Data	<2	No Data
SW97-04	NDB-659	10/15/1997	No Data	-3.4	No Data	<2	No Data
SW97-05	NDB-657	10/15/1997	No Data	<1	No Data	<2	No Data
SW97-05E	NDB-685	10/22/1997	No Data	-4.2	No Data	<2	No Data
Sorenson	NDB-661, NDB-664	10/16/1997	159	-4.1	-6.1	17.2	<2
	NDB-665	10/16/1997	No Data	-4.1	No Data	20.6	No Data
W-4	NDB-653, NDB-654	10/14/1997	34.1	10.3	9.3	<2	<2

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "-" indicates an estimated value. An "R" indicates that the result was determined unusable through data validation. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> Sample was unfiltered.

Table A-19. Groundwater Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Alkalinity (as CaCO <sub>3</sub> ) (ppm)	Alpha (pCi/L) <sup>b</sup>	Alpha <sup>c</sup> (pCi/L) <sup>b</sup>	As (μg/L)	Beta (pCi/L) <sup>b</sup>	Beta <sup>c</sup> (pCi/L) <sup>b</sup>	Ca (μg/L)	CDT <sup>d</sup> (μmhos/cm)
31NE93-205	NDB-138, NDB-139	10/23/1997	169	6.70	-5.56	-26.9	7.75	-4.36	85500	1018
31SW93-200-1	NDB-126, NDB-650	10/16/1997	207	<3.05	-1.56	-3.1	3.92	<1.65 <sup>e</sup>	65700	599
31SW93-200-2	NDB-646, NDB-647	10/16/1997	430	<4.33	-3.27	8.5R	<4.02	-3.62	20300R	825
31SW93-200-3	NDB-644, NDB-645	10/16/1997	416	<35.75	-2.05	-3.6	<36.72	-2.14	251000R	5300
31SW93-200-4	NDB-648, NDB-649	10/16/1997	421	57.80	-36.85	5.2R	46.97	-36.72	512000R	4980
82-07	NDB-127	10/16/1997	407	157.5	No Data	-6.3	122.2	No Data	356000	2780
82-20	NDB-128	10/20/1997	312	<18.43	No Data	2.4R	<18.43	No Data	504000R	1967
83-70	NDB-133, NDB-134	10/21/1997	207	3.31	-3.76	<2.2 <sup>e</sup>	4.25	-4.99	55500	622
88-85	NDB-640	10/15/1997	404	158.7	No Data	-16.2	140.5	No Data	322000	2590
92-05	NDB-626	10/13/1997	266	<10.29	No Data	-10.8	<10.96	No Data	308000	1670
92-06	NDB-627, NDB-628	10/13/1997	191	<3.03	-1.37	-3.3	3.35	-2.05	72600	566
92-09	NDB-643	10/15/1997	340	128.4	No Data	<2.2 <sup>e</sup>	62.89	No Data	376000	2730
92-10	NDB-641, NDB-642	10/15/1997	199	<3.95	-3.47	<2.2 <sup>e</sup>	<3.74	-3.64	85400	751
92-11	NDB-135	10/21/1997	408	1002	No Data	-39.5	433.3	No Data	262000	2750
92-12	NDB-680, NDB-681	10/20/1997	299	5.34	-5.78	<2.2 <sup>e</sup>	<3.76	-2.21	39100	900
92-13	NDB-677	10/17/1997	300	10.24	-7.00	-36.7	<3.35	-2.05	8930	690
	NDB-676	10/20/1997	300	10.24	-7.00	-36.7	<3.35	-2.05	8930	690
93-01	NDB-129, NDB-130	10/21/1997	213	<3.03	-3.09	-5.0	<2.81	-2.57	68100	607
	NDB-132, NDB-131	10/21/1997	No Data	3.34	-3.18	-3.8	<2.82	-3.19	67300	No Data
95-01	NDB-631	10/14/1997	179	3.54	No Data	-4.1	4.32	No Data	39800	612
	NDB-632	10/14/1997	No Data	<3.01	No Data	-3.7	5.12	No Data	39100	No Data
95-02	NDB-633, NDB-634	10/14/1997	176	<2.98	-2.63	-4.0	5.44	-3.92	38800	610
95-03	NDB-637	10/15/1997	239	10.84	No Data	<2.2 <sup>e</sup>	<9.28	No Data	164000	1607
95-04	NDB-638, NDB-639	10/15/1997	235	17.05	-7.51	-3.3	13.73	-8.54	173000	1697
95-06	NDB-629, NDB-630	10/14/1997	307	35.54	-31.77	-4.2	23.08	-30.74	211000	2130
95-07	NDB-678, NDB-679	10/20/1997	1330	<13.39	-5.12	3.2R	<12.48	-5.09	6070R	2380
95-08	NDB-136, NDB-137	10/23/1997	268	<3.05	-4.61	<2.2 <sup>e</sup>	5.22	-3.21	28300	615

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "-" indicates an estimated value. An "R" indicates that the result was potentially affected by high turbidity. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> The values listed multiplied by 10<sup>-9</sup> will result in microcuries per milliliter.

<sup>c</sup> Results determined using EPA Method 00-02-01: a method for determining gross alpha (and gross beta) in drinking water using coprecipitation.

<sup>d</sup> Conductivity in micromhos per centimeter.

<sup>e</sup> Estimated.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Cl (µg/L)	Co (µg/L)	Cu (µg/L)	Eh <sup>b</sup> (mV)	F (µg/L)	H <sub>2</sub> O Depth (feet)	K (µg/L)	Mg (µg/L)
31NE93-205	NDB-138, NDB-139	10/23/1997	2970	<1.1	~3.2	No Data	~131	178.43	4530	23900
31SW93-200-1	NDB-126, NDB-650	10/16/1997	2490	<1.1	<2.2	No Data	~145	117.88	2330	11100
31SW93-200-2	NDB-646, NDB-647	10/16/1997	6070	2.5R	6.4R	No Data	1060	114.31	3210R	5960R
31SW93-200-3	NDB-644, NDB-645	10/16/1997	72100	~4.9	6.3	No Data	641	20.05	17200R	78400R
31SW93-200-4	NDB-648, NDB-649	10/16/1997	103000	4.2R	4.3R	No Data	256	19.89	21200R	165000R
82-07	NDB-127	10/16/1997	146000	~2.4	3.5	No Data	480	9.90	9550	86900
82-20	NDB-128	10/20/1997	19400	10.0R	2.2R	No Data	~167	16.36	2610R	93000R
83-70	NDB-133, NDB-134	10/21/1997	3370	<1.1	<2.2	No Data	~150	34.29	2620	10600
88-85	NDB-640	10/15/1997	143000	<1.1	3.7	No Data	426	8.05	9930	74200
92-05	NDB-626	10/13/1997	14700	<1.1	4.3	No Data	~148	16.79	2640	44200
92-06	NDB-627, NDB-628	10/13/1997	2120	<1.1	3.9	No Data	~136	109.96	1780	9850
92-09	NDB-643	10/15/1997	121000	~1.1	4.3	No Data	217	9.39	1140	87700
92-10	NDB-641, NDB-642	10/15/1997	17400	<1.1	<2.2	No Data	~131	12.47	2610	13600
92-11	NDB-135	10/21/1997	106000	~1.2	3.4	No Data	625	No Data	29700	59000
92-12	NDB-680, NDB-681	10/20/1997	3820	<1.1	<2.2	196	411	52.75	3570	11200
92-13	NDB-677	10/17/1997	4600	<1.1	~2.5	155	1120	106.3	2550	2200
	NDB-676	10/20/1997	4600	<1.1	~2.5	155	1120	106.3	2550	2200
93-01	NDB-129, NDB-130	10/21/1997	2780	<1.1	<2.2	No Data	~191	107.51	2180	10600
	NDB-132, NDB-131	10/21/1997	2790	<1.1	<2.2	No Data	~193	No Data	2150	10400
95-01	NDB-631	10/14/1997	5670	<1.1	4.2	No Data	277	4.95	2790	10800
	NDB-632	10/14/1997	5700	<1.1	3.5	No Data	272	No Data	2750	10600
95-02	NDB-633, NDB-634	10/14/1997	5350	<1.1	3.9	No Data	242	3.01	2720	10600
95-03	NDB-637	10/15/1997	74100	<1.1	5.6	No Data	~188	3.73	3220	53300
95-04	NDB-638, NDB-639	10/15/1997	82000	<1.1	3.5	No Data	~177	4.30	3390	54200
95-06	NDB-629, NDB-630	10/14/1997	93500	~2.5	~2.8	No Data	~149	69.87	6610	55700
95-07	NDB-678, NDB-679	10/20/1997	26500	1.1R	3.5R	~74	2970	69.45	5350R	3230R
95-08	NDB-136, NDB-137	10/23/1997	5950	<1.1	4.7	No Data	825	127.88	3410	8620

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an estimated value. An "R" indicates that the result was potentially affected by high turbidity. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> Oxidation potential in millivolts.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Mn ( $\mu\text{g/L}$ )	Mo ( $\mu\text{g/L}$ )	Na ( $\mu\text{g/L}$ )	$\text{NO}_3+\text{NO}_2\text{-N}^b$ ( $\mu\text{g/L}$ )	Pb ( $\mu\text{g/L}$ )	Pb-210 (pCi/L) <sup>c</sup>	pH	Ra-226 (pCi/L) <sup>c</sup>
31NE93-205	NDB-138, NDB-139	10/23/1997	813	2.0	96100	-19.9	<1.1	<0.85	6.76	2.88
31SW93-200-1	NDB-126, NDB-650	10/16/1997	286	2.4	45200	-30.6	<1.1	<0.86	7.41	2.27
31SW93-200-2	NDB-646, NDB-647	10/16/1997	102R	12.5R	184000R	-15.2	1.1R	<0.90	8.35	1.69
31SW93-200-3	NDB-644, NDB-645	10/16/1997	264R	4.8	985000R	-45.3	1.1R	<0.89	6.92	<0.31
31SW93-200-4	NDB-648, NDB-649	10/16/1997	715R	5.6R	567000R	568	1.1R	<0.84	6.72	<0.35
82-07	NDB-127	10/16/1997	175	46.9	214000	3470	<1.1	<1.02	6.63	<0.37
82-20	NDB-128	10/20/1997	886R	5.1R	93200R	1490	1.1R	<0.85	6.79	<0.43
83-70	NDB-133, NDB-134	10/21/1997	271	1.2	60800	-16.7	<1.1	<0.86	7.34	1.95
88-85	NDB-640	10/15/1997	46.7	53.5	198000	3270	<1.1	1.15	6.62	<0.43
92-05	NDB-626	10/13/1997	<1.1	2.4	43000	738	<1.1	<0.93	6.87	<0.34
92-06	NDB-627, NDB-628	10/13/1997	412	2.5	30600	-26.2	<1.1	<0.85	7.61	1.04
92-09	NDB-643	10/15/1997	121	3.2	195000	-10.7	<1.1	<0.90	7.00	<0.26
92-10	NDB-641, NDB-642	10/15/1997	356	1.4	56400	-13.2	<1.1	<0.83	7.18	1.90
92-11	NDB-135	10/21/1997	4060	253	297000	876	<1.1	<0.94	6.70	<0.23
92-12	NDB-680, NDB-681	10/20/1997	<1.1	47.6	130000	1050	<1.1	<0.89	7.22	1.33
92-13	NDB-677	10/17/1997	7.3	50.7	141000	1550	<1.1	<0.88	9.48	1.15
	NDB-676	10/20/1997	7.3	50.7	141000	1550	<1.1	<0.88	9.48	1.15
93-01	NDB-129, NDB-130	10/21/1997	358	1.6	47300	-22.4	<1.1	<0.87	7.35	2.08
	NDB-132, NDB-131	10/21/1997	355	1.6	46200	-17.0	<1.1	<0.81	No Data	1.67
95-01	NDB-631	10/14/1997	200	<1.1	71800	-21.1	<1.1	<0.80	7.12	1.90
	NDB-632	10/14/1997	196	<1.1	70700	-19.2	<1.1	<0.82	No Data	2.16
95-02	NDB-633, NDB-634	10/14/1997	194	<1.1	71400	-19.9	<1.1	<0.86	7.13	1.29
95-03	NDB-637	10/15/1997	392	6.6	113000	-16.8	<1.1	<0.85	7.12	3.18
95-04	NDB-638, NDB-639	10/15/1997	453	6.9	124000	<4.0	<1.1	<0.82	7.12	2.67
95-06	NDB-629, NDB-630	10/14/1997	493	2.7	210000	-42.7	<1.1	<0.81	7.26	<0.36
95-07	NDB-678, NDB-679	10/20/1997	65.6R	1.1R	613000R	-13.0	1.1R	<0.89	7.78	2.01
95-08	NDB-136, NDB-137	10/23/1997	48.6	<1.1	94100	-50.2	<1.1	<0.83	7.68	1.58

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "-" indicates an estimated value. An "R" indicates that the result was potentially affected by high turbidity. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> (Nitrate + nitrite) as nitrogen.

<sup>c</sup> The values listed multiplied by  $10^{-9}$  will result in microcuries per milliliter.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Rn-222 (pCi/L) <sup>b</sup>	Se (µg/L)	SO <sub>4</sub> (µg/L)	TDS <sup>c</sup> (mg/L)	Temperature (degrees C)	Th-230 (pCi/L) <sup>b</sup>	Turbidity (NTU) <sup>d</sup>	U (µg/L)
31NE93-205	NDB-138, NDB-139	10/23/1997	123	<2.2	324000	700	15.0	<0.80	0.51	<1.1
31SW93-200-1	NDB-126, NDB-650	10/16/1997	88	<2.2	96000	363	14.7	<0.80	1.42	<1.1
31SW93-200-2	NDB-646, NDB-647	10/16/1997	44	2.2R	17700	502	11.6	<0.80	106	1.1R
31SW93-200-3	NDB-644, NDB-645	10/16/1997	53	<2.2	2370000	4260	10.4	<0.80	79.1	1.7
31SW93-200-4	NDB-648, NDB-649	10/16/1997	82	2.2R	2350000	4410	11.3	<0.80	>1000	19.2R
82-07	NDB-127	10/16/1997	732	17.2	918000	2150	12.0	No Data	1.25	452
82-20	NDB-128	10/20/1997	416	3.8R	1360000	2360	12.1	No Data	>1000	9.0R
83-70	NDB-133, NDB-134	10/21/1997	310	<2.2	103000	335	10.5	2.3	2.87	<1.1
88-85	NDB-640	10/15/1997	1609	<2	836000	1960	12.6	<0.80	3.22	560
92-05	NDB-626	10/13/1997	430	<2.2	679000	1340	13.3	<0.80	9.78	6.1
92-06	NDB-627, NDB-628	10/13/1997	61	<2.2	89500	340	9.8	<0.80	3.61	<1.1
92-09	NDB-643	10/15/1997	473	<2.2	1030000	2180	12.7	<0.80	0.39	266
92-10	NDB-641, NDB-642	10/15/1997	134	<2.2	149000	487	10.6	<0.80	2.16	<1.1
92-11	NDB-135	10/21/1997	975	7.0	965000	1990	12.1	<0.80	1.19	1620
92-12	NDB-680, NDB-681	10/20/1997	63	3.9	117000	485	13.3	<2.0	6.29	3.1
92-13	NDB-677	10/17/1997	154	3.4	25800	420	10.0	<0.80	7.63	2.3
	NDB-676	10/20/1997	154	3.4	25800	420	10.0	<0.80	7.63	2.3
93-01	NDB-129, NDB-130	10/21/1997	130	<2.2	94500	355	10.2	<0.80	4.10	<1.1
	NDB-132, NDB-131	10/21/1997	122	<2.2	94000	337	No Data	<0.80	No Data	<1.1
95-01	NDB-631	10/14/1997	477	<2.2	113000	367	13.1	<0.80	1.23	<1.1
	NDB-632	10/14/1997	444	<2.2	113000	385	No Data	<0.80	No Data	<1.1
95-02	NDB-633, NDB-634	10/14/1997	195	<2.2	111000	375	12.0	<0.80	3.99	<1.1
95-03	NDB-637	10/15/1997	175	<2.2	516000	1140	12.0	<0.80	1.34	7.0
95-04	NDB-638, NDB-639	10/15/1997	122	<2.2	546000	1210	10.9	<0.80	2.20	4.9
95-06	NDB-629, NDB-630	10/14/1997	13	<2.2	720000	1550	12.2	<0.80	12.3	56.1
95-07	NDB-678, NDB-679	10/20/1997	29	2.2R	686	1540	10.7	<0.80	168	1.1R
95-08	NDB-136, NDB-137	10/23/1997	169	<2.2	34600	358	15.0	<0.80	2.14	<1.1

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an estimated value. An "R" indicates that the result was potentially affected by high turbidity. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> The values listed multiplied by 10<sup>-9</sup> will result in microcuries per milliliter.

<sup>c</sup> Total dissolved solids.

<sup>d</sup> Nephelometric turbidity units.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	U-234 (pCi/L) <sup>b</sup>	U-235 (pCi/L) <sup>b</sup>	U-238 (pCi/L) <sup>b</sup>	V (µg/L)	Zn (µg/L)
31NE93-205	NDB-138, NDB-139	10/23/1997	<1.0	<1.1	<1.1	<1.1	<2
31SW93-200-1	NDB-126, NDB-650	10/16/1997	<1.0	<1.1	<1.1	-1.6	<2
31SW93-200-2	NDB-646, NDB-647	10/16/1997	<1.0	<1.1	<1.1	1.1R	2R
31SW93-200-3	NDB-644, NDB-645	10/16/1997	<1.0	<1.1	<1.1	<1.1	130R
31SW93-200-4	NDB-648, NDB-649	10/16/1997	8.7	<1.1	6.6	1.1R	54.2R
82-07	NDB-127	10/16/1997	No Data	No Data	No Data	87.0	<2
82-20	NDB-128	10/20/1997	No Data	No Data	No Data	1.1R	57.3R
83-70	NDB-133, NDB-134	10/21/1997	<1.0	<1.1	<1.1	<1.1	<2
88-85	NDB-640	10/15/1997	No Data	No Data	No Data	428	<2
92-05	NDB-626	10/13/1997	No Data	No Data	No Data	<1.1	<2
92-06	NDB-627, NDB-628	10/13/1997	<0.40	<1.1	<1.1	<1	<2
92-09	NDB-643	10/15/1997	No Data	No Data	No Data	<1.1	<2
92-10	NDB-641, NDB-642	10/15/1997	<1.0	<1.1	<1.1	<1.1	<2
92-11	NDB-135	10/21/1997	No Data	No Data	No Data	953	34.0
92-12	NDB-680, NDB-681	10/20/1997	<1.0	<1.1	<1.1	<1.1	<2
92-13	NDB-677	10/17/1997	12.3	<1.1	<1.1	-3.6	<2
	NDB-676	10/20/1997	12.3	<1.1	<1.1	-3.6	<2
93-01	NDB-129, NDB-130	10/21/1997	<1.0	<1.1	<1.1	<1.1	<2
	NDB-132, NDB-131	10/21/1997	<1.0	<1.1	<1.1	-1.7	<2
95-01	NDB-631	10/14/1997	<1.0	<1.1	<1.1	<1.1	<2
	NDB-632	10/14/1997	<1.0	<1.1	<1.1	<1.1	<2
95-02	NDB-633, NDB-634	10/14/1997	<0.40	<1.1	<1.1	<1.1	<2
95-03	NDB-637	10/15/1997	<1.0	<1.1	2.4	<1.1	<2
95-04	NDB-638, NDB-639	10/15/1997	<1.0	<1.1	1.8	<1.1	<2
95-06	NDB-629, NDB-630	10/14/1997	28.1	<1.1	19.5	<1.1	<2
95-07	NDB-678, NDB-679	10/20/1997	<1.0	<1.1	<1.1	1.1R	2.2R
95-08	NDB-136, NDB-137	10/23/1997	<1.0	<1.1	<1.1	<1.1	<2

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "-" indicates an estimated value. An "R" indicates that the result was potentially affected by high turbidity. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> The values listed multiplied by 10<sup>-9</sup> will result in microcuries per milliliter.

Table A-20. QA/QC Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Alpha (pCi/L) <sup>b</sup>	Alpha <sup>c</sup> (pCi/L) <sup>b</sup>	As (µg/L)	Beta (pCi/L) <sup>b</sup>	Beta <sup>c</sup> (pCi/L) <sup>b</sup>	Ca (µg/L)	Cl (µg/L)	Co (µg/L)
Equipment Blank	NDB-635, NDB-636	10/14/1997	<0.73	<0.69 <sup>d</sup>	<2.2 <sup>d</sup>	<1.44	<1.64 <sup>d</sup>	<19	<4.0	<1.1
	NDB-668	10/16/1997	<1.02	No Data	<2.2 <sup>d</sup>	<2.02	No Data	<19	<4.0	<1.1
	NDB-671	10/16/1997	<1.02	No Data	<2.2 <sup>d</sup>	<2.02	No Data	<19	<4.0	<1.1
Sample Location	Ticket Numbers	Sample Date	Cu (µg/L)	F (µg/L)	K (µg/L)	Mg (µg/L)	Mn (µg/L)	Mo (µg/L)	Na (µg/L)	NO <sub>3</sub> +NO <sub>2</sub> -N <sup>e</sup> (µg/L)
Equipment Blank	NDB-635, NDB-636	10/14/1997	3.5	<2.0	<48.9	<13	<1.1	<1.1	<297	~12.3
	NDB-668	10/16/1997	<2.2	<2.0	<48.9	~22.7	<1.1	<1.1	<297	~7.3
	NDB-671	10/16/1997	<2.2	<2.0	<48.9	~32.7	<1.1	<1.1	<297	~13.8

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an estimated value. An "R" indicates that the result was determined unusable through data validation. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> The values listed multiplied by 10<sup>-6</sup> will result in microcuries per milliliter.

<sup>c</sup> Results determined using EPA Method 00-02-01; a method for determining gross alpha (and gross beta) in drinking water using coprecipitation.

<sup>d</sup> Estimated.

<sup>e</sup> (Nitrate + nitrite) as nitrogen.

Table A-20 (continued). QA/QC Chemistry Data Collected At and Near the MMTS During 1997<sup>a</sup>

Sample Location	Ticket Numbers	Sample Date	Pb (µg/L)	Pb-210 (pCi/L) <sup>b</sup>	Ra-226 (pCi/L) <sup>b</sup>	Rn-222 (pCi/L) <sup>b</sup>	Se (µg/L)	SO <sub>4</sub> (µg/L)	TDS <sup>c</sup> (mg/L)	Th-230 (pCi/L) <sup>b</sup>
Equipment Blank	NDB-635, NDB-636	10/14/1997	<1.1	<0.88	<0.31	13	<2	-190	<10.0	<0.80
	NDB-668	10/16/1997	<1.1	<0.88	1.49	No Data	-2.3	-165	No Data	No Data
	NDB-671	10/16/1997	<1.1	<0.83	<0.25	No Data	<2.2	-186	No Data	No Data

Sample Location	Ticket Numbers	Sample Date	U (µg/L)	U-234 (pCi/L) <sup>b</sup>	U-235 (pCi/L) <sup>b</sup>	U-238 (pCi/L) <sup>b</sup>	V (µg/L)	Zn (µg/L)
Equipment Blank	NDB-635, NDB-636	10/14/1997	<1.1	<0.40	<1.1	<1.1	<1.1	<2
	NDB-668	10/16/1997	<1.1	No Data	No Data	No Data	<1.1	<2
	NDB-671	10/16/1997	<1.1	No Data	No Data	No Data	<1.1	<2

<sup>a</sup> A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "-" indicates an estimated value. An "R" indicates that the result was determined unusable through data validation. All samples were filtered in the field unless otherwise noted.

<sup>b</sup> The values listed multiplied by 10<sup>-6</sup> will result in microcuries per milliliter.

<sup>c</sup> Total dissolved solids.